TECHNOLOGY DEPT.

Gas Journal

VOL. 289. 109th YEAR. LONDON, MARCH 20, 1957. No. 4888. PRICE 1/6

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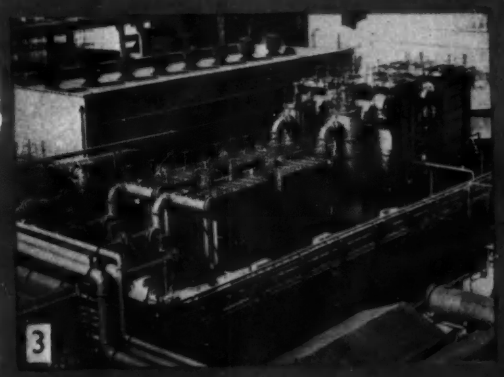
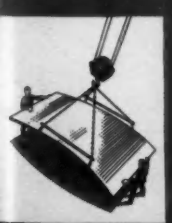
DETROIT

WHESSOE

some recent

installations





1: Benzole scrubbers built for Woodall-Duckham Construction Co. Ltd. for The National Coal Board at Chesterfield.

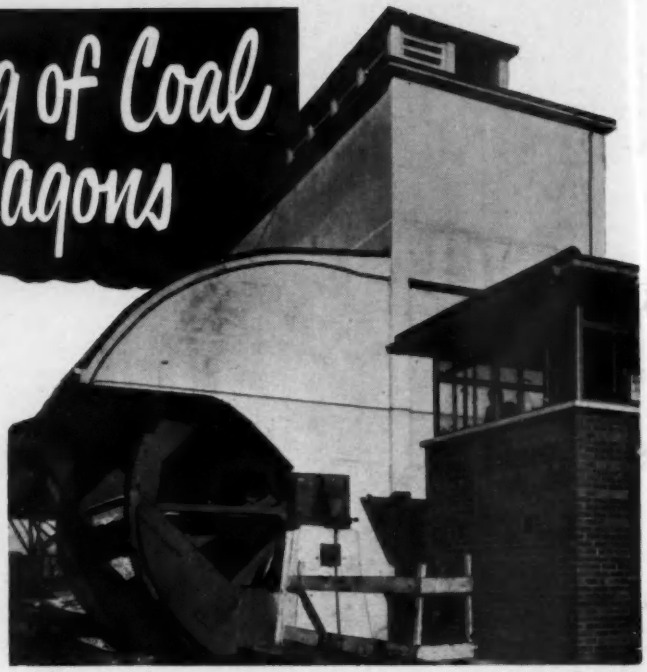
2: Gas Drying Plant built at Bromley for North Thames Gas Board.

3: Two complete purification streams supplied to Woodall-Duckham Construction Co. Ltd. for East Midlands Gas Board at Rotherham.

4: 2 million cubic feet capacity welded gasholder at Bishop Auckland for Northern Gas board.

ADVERTISEMENT OF WHESSOE LIMITED DARLINGTON AND LONDON

Dustless tipping of Coal from Railway Wagons



by the

ROTASIDE TIPPLER

combined with the
Strachan & Henshaw
patented

DUST TRAPPING SYSTEM

No Fans! No Filters!
Very little power required!

Full particulars from—

STRACHAN & HENSHAW LTD

STEELHOIST WORKS BRISTOL 2 *Telephone 78331*

The

DONKIN HANSON
AUTO-PILOT GOVERNOR
FOR USE WITH STATION GOVERNORS

THIS PILOT GOVERNOR IS OPERATED BY AN EIGHT-DAY CLOCK, AND CHANGES THE PRESSURE TO MEET PEAK LOADS, ACCORDING TO REQUIREMENTS. A DIFFERENT LINE CAN BE GIVEN FOR EACH DAY OF THE WEEK IF REQUIRED.

The **BRYAN DONKIN CO LTD** · Chesterfield

LONDON MANCHESTER MEMBERS OF THE SOCIETY OF BRITISH GAS INDUSTRIES

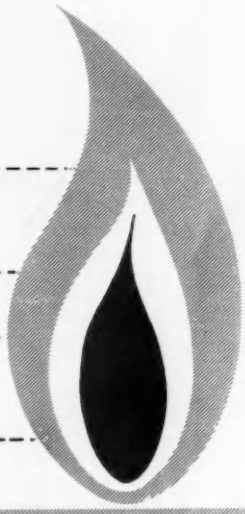
INDUSTRIAL AND DOMESTIC THERMOSTATS

REMOTE CONTROL VALVES

SMALL GAS FITTINGS

FLAME FAILURE EQUIPMENT

MAIN COCKS



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Sperson TRADE MARK

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MOORSOM STREET, BIRMINGHAM 6. Phone: Aston Cross 4011 (5 lines)
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George Glover

& Co. Ltd.

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INDUSTRIAL METERS

GAS METERS

TEST METERS

KINGS RD. CHELSEA LONDON S.W.

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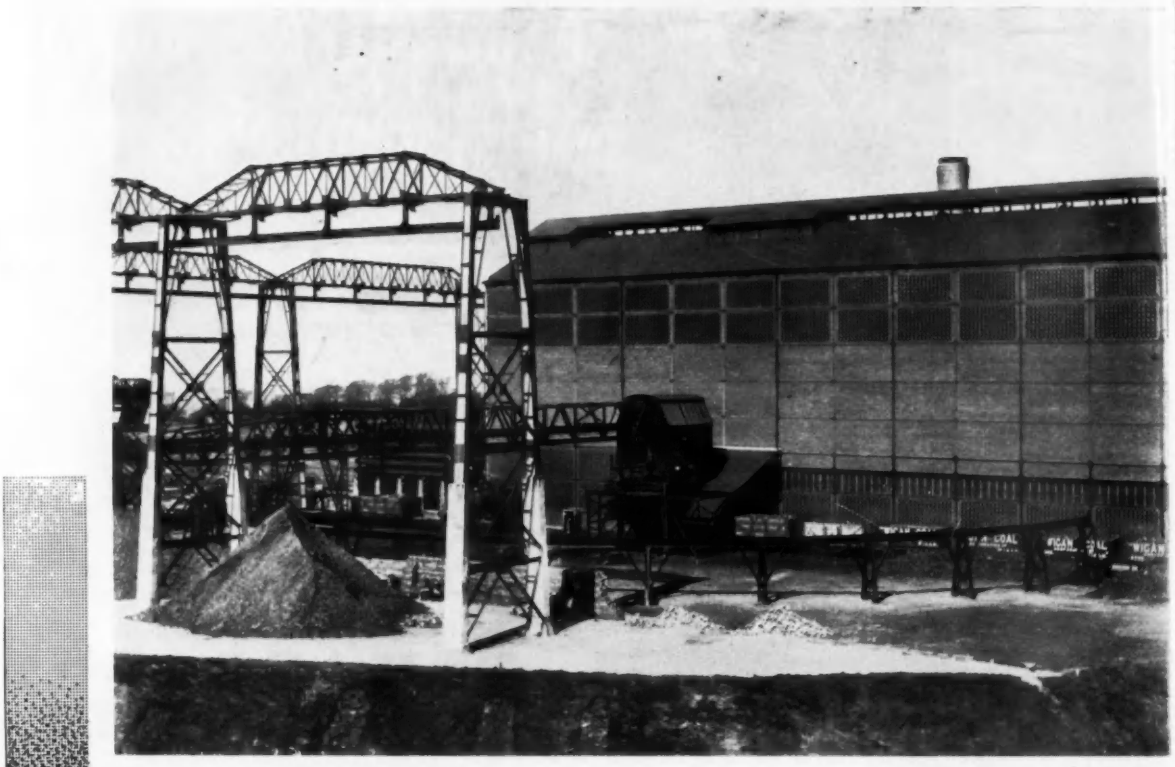
LEEDS · MANCHESTER

Product of Radiation Ltd



Photograph published by courtesy of the North Western Gas Board

COAL HANDLING PLANT

Photograph shows :

Coal Stocking and Reclaiming Radial Transporter fed or reclaimed by overhead Telpher.

1847 D 1957

by DRAKES of HALIFAX LIMITED

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CONSTRUCTIONAL GAS ENGINEERS FOR MORE THAN A CENTURY

J.J.M.

when atmospheric pollution is severe

– specify ATLAS Rubber Paints. These are products designed specifically for the complete protection of structural iron and steel work in foundries, sugar refineries, gasworks, paper mills, galvanising and plating shops, canneries, dyehouses and other places where severe acid or alkaline fumes abound and corrosion is rife.

We will gladly give you technical advice on the best use of ATLAS Rubber Paints to meet your particular requirements.

Write to us now for colour card and price list.

ATLAS

DESIGNED TO RESIST SEVERE CORROSIVE CONDITIONS

Rubber Paints

ATLAS PRESERVATIVE CO. LTD., ERITH, KENT. 'Phone: ERITH 2255 (3 lines), 5721 (4 lines) 'Grams: Deoxydizer, Erith.

TAS/AS 162

Fuel Conservation

IT IS TRUE to say that in spite of the shortage of most kinds of fuel in the Country today, large quantities of valuable combustible material are wasted.

What happens to the Pan Ash from the Retort Furnaces, bearing in mind that it almost invariably contains a good deal of coke – perhaps 20% or perhaps over 30%? Does a contractor cart it away, including the coke?

In making 750 million cubic feet of coal gas, probably 2,000 tons of pan ash are produced and it could contain from 300 to 600 tons of usable coke – worth perhaps £2,000 to £4,000. Some works make ten times as much gas, and ten times as much pan ash.

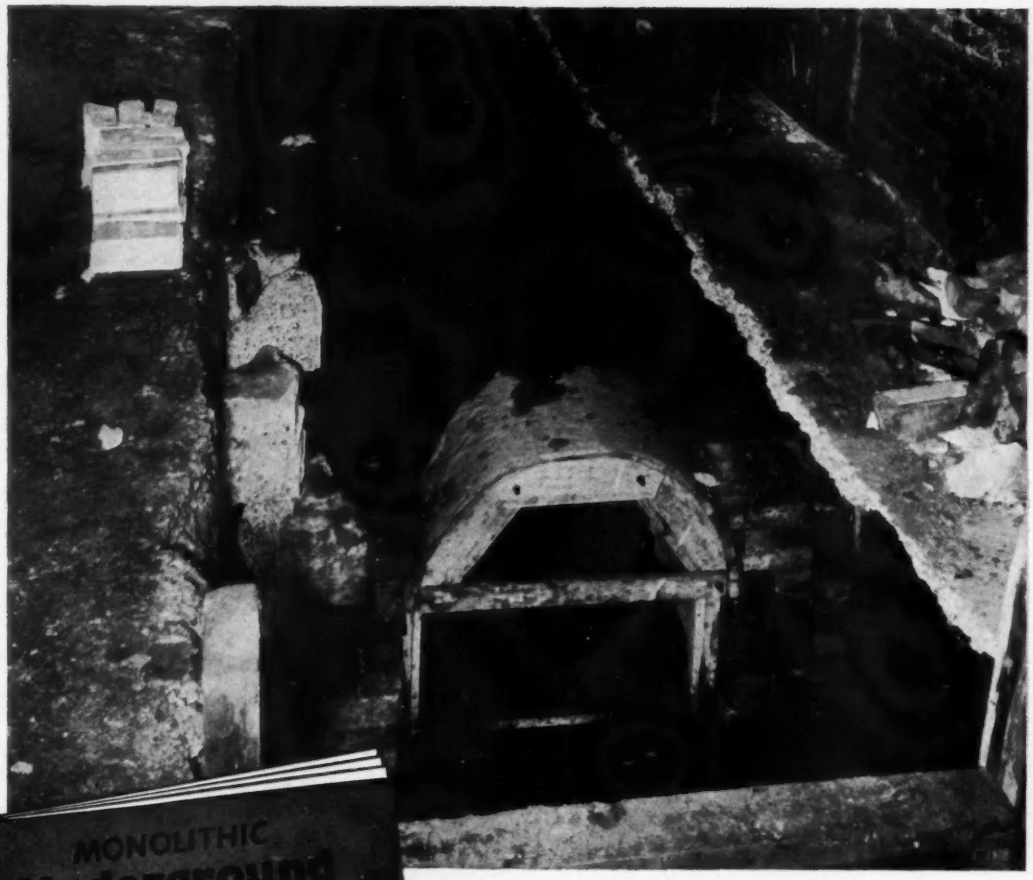
These figures are worth more than casual consideration, not only because the wasted coke from the ashes could be recovered and used in the works, releasing an equivalent tonnage of yard coke for sale, but because surely from the National point of view, no material which is a fuel should be wasted.

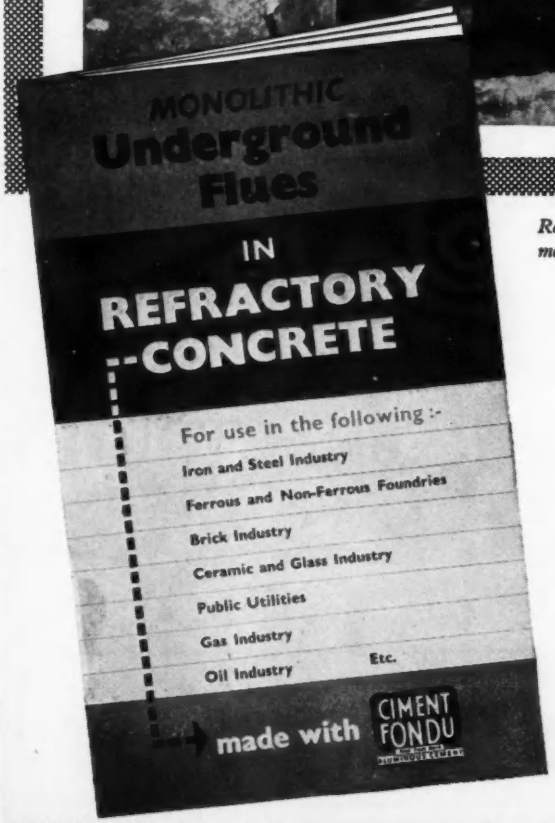
Our Fuel Recovery Plant will separate the coke from the pan ash. We can demonstrate it to you here, or we will gladly send particulars.

GEORGE WALLER & SON LIMITED

PHOENIX IRON WORKS · STROUD · GLOS

Telephone Brimscombe 2301-2 *Telegrams* Waller, Stroud





Refractory Concrete monolithic flue in course of construction. Note movable former centred in trench.

Send for a copy of this interesting booklet dealing with the construction of MONOLITHIC FLUES

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Regd. Trade Mark
ALUMINOUS CEMENT

The Cement for Industry

FOR SPEED · STRENGTH
RESISTANCE
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Manufactured by

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Square brick and "Frisil B" Nostril Plug from the Derbyshire Silica Firebrick Company's range of products.

The greater the insistence on furnace efficiency, the greater the need for

DERBYSHIRE SILICA REFRACTORIES

DERBYSHIRE "S" and "D.S.F."
(90% Silica)

Refractories for all purposes including Vertical and Horizontal Retorts, Soakers, Puddling Furnaces, Reheating and Annealing Furnaces, Forge Furnaces, Checkers, Cupolas and Glass Furnaces.

Other D.S.F. products include
PEAKSIL *(95% Silica)* FRISIL *(Sillimanite)*
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(The new British Plastic Refractory)
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TOWER PURIFIERS

THE WALKER TOWER PURIFIER

introduces a new design into this Country. The plant combines comparatively low initial cost of installation with reliability in working. It is simple to operate and maintenance charges are reduced to a minimum.

SOME ADVANTAGES OF THIS SYSTEM

- ★ EACH TOWER CONSISTS OF A STACK OF WELDED STEEL TRAYS. NO OUTER CASING OR GANGWAYS ARE REQUIRED.
- ★ EACH TRAY IS OF ROBUST CONSTRUCTION. THERE ARE NO INTERNAL STIFFENERS TO INTERFERE WITH THE PURIFYING MATERIAL.
- ★ ARRANGEMENTS MAY BE MADE FOR UPWARD OR DOWNWARD OR SPLIT FLOW OF GAS THROUGH THE PURIFYING MATERIAL.
- ★ COMPACT ARRANGEMENT OF GAS CONNECTIONS AND VALVES IN BOTTOM OF EACH TOWER GIVING ADEQUATE PROTECTION FROM FROST.
- ★ RUBBER SEALING RINGS BETWEEN TRAYS ENSURE GAS TIGHTNESS. NO WATER SEALS ARE REQUIRED.

THE OLD WAY

Automation in Purification

WATER VALVES ARE USED, FOR GAS CONTROL, WHICH ARE POSITIVE IN ACTION.

RECORDERS SHOW FUNCTIONING OF WATER VALVES.

WATER VALVES ARE OPERATED BY REMOTE CONTROL, OR ALTERNATIVELY THEY MAY BE DIRECTLY OPERATED.

PROVISION IS MADE FOR EASY CLEANING OR REPLACEMENT OF ESSENTIAL WORKING PARTS.

EACH TOWER IS TESTED TO 60" W.G. AIR PRESSURE BEFORE BEING PUT INTO COMMISSION.

THE NEW WAY

ASK TO SEE THE DEMONSTRATION VALVE OPERATION PANEL AT OUR WORKS AT DONNINGTON — SHROPSHIRE

please send us your enquiries

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Cut your costs with

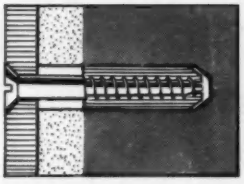
21 RAWLPLUG FIXING DEVICES

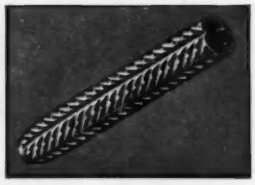
FOR SPEEDY FIXING IN ANY MATERIAL

No more trouble or costly delay because the material was 'difficult'! Whether it's concrete or plastic, breeze or sheet metal, cavity brick or lath and plaster, there's a Rawlplug Fixing Device that makes firm screw or bolt fixings quickly, easily and economically. The speedy answer to every fixing problem is one or other of the 21 different types of Rawlplug Fixing Devices. Write for illustrated brochure.

Screw Fixings

Use the famous RAWLPLUG for neat, firm fixings in brick, stone, etc. All sizes up to ¾" diameter Coach Screws. Rawlplugs are waterproof and unaffected by climatic conditions.

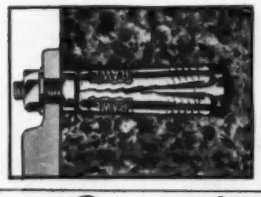


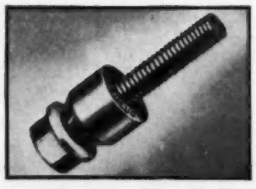


Rawlplug WHITE BRONZE PLUGS are specially suitable when the fixing is subject to very high temperatures, such as the outer brick coverings of furnaces. Use also for under-water fixtures.

Bolt Fixings

For bolting down machines, use RAWLBOLTS, a dry fixing that grips by expansion. No cold chiselling, no waiting for cement to harden. Sizes up to 1" bolt diameter.

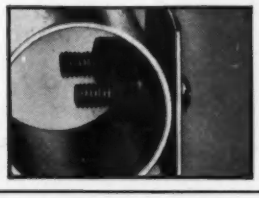


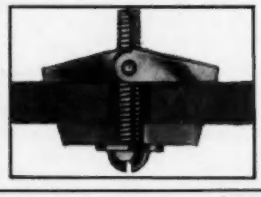


Use Rawlplug BOLT ANCHORS for bolting down in extremely wet or corrosive situations. Caulking completely seals the anchorage. Use also for anchoring Diesel Generators, Power Hammers, etc.

Cavity Fixings

Screwed up from the front the amazing RAWLNUT forms its own rivet head behind the material—airtight, watertight, vibration-proof, squeak-proof! For all thin or hollow materials.





For ceilings of lath and plaster, plasterboard, etc., use Rawlplug SPRING TOGGLES. The inserted Toggle springs open behind the material, spreading the load over a wide area.

USED BY THE MILLION THROUGHOUT INDUSTRY

RAWLPLUG FIXING DEVICES

21 *different types of fixing devices for Speed and Strength*

Made by THE RAWLPLUG CO. LTD., CROMWELL ROAD, LONDON, S.W.7
The World's largest Manufacturers of Fixing Devices.

Monk on National Service

Again associated, as they have been on many other occasions, with N.C.B. development work, Monk played a part in the construction of the Avenue Carbonisation Plant at Chesterfield. Equipped technically and mechanically to speed such National undertakings, Monk's contribution to building Industrial Britain is naturally considerable.

Building, Civil Engineering and Reinforced Concrete Contractors.

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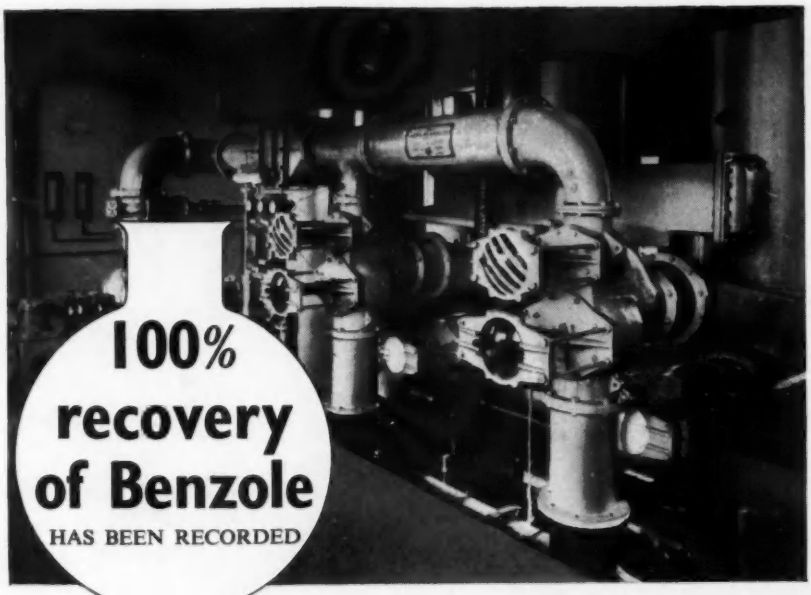

100% recovery of Benzole
HAS BEEN RECORDED

100% recovery of Benzole has been recorded in the Gas Industry where Sutcliffe Speakman plants of the type illustrated are already installed.

These recovery plants are the result of over twenty years' experience in the manufacture and industrial use of Active Carbon. Their capacities range from 250,000 cu. ft. per day. Entirely automatic and with few moving parts, they are compact, clean in operation, and economical to run. Their initial cost, too, compares favourably with that of other recovery systems.
In every way they are the most profitable investments. We are always ready to draw up a complete balance sheet for Benzole recovery in any specific undertaking of the Gas Industry.

to cut Benzole wastage to a minimum, consult

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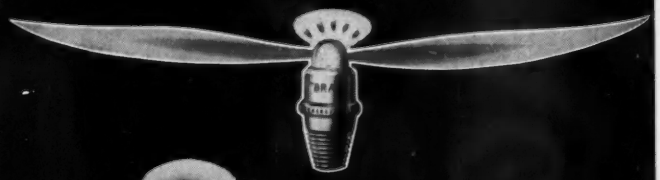
BRAY
NEAT GAS JETS

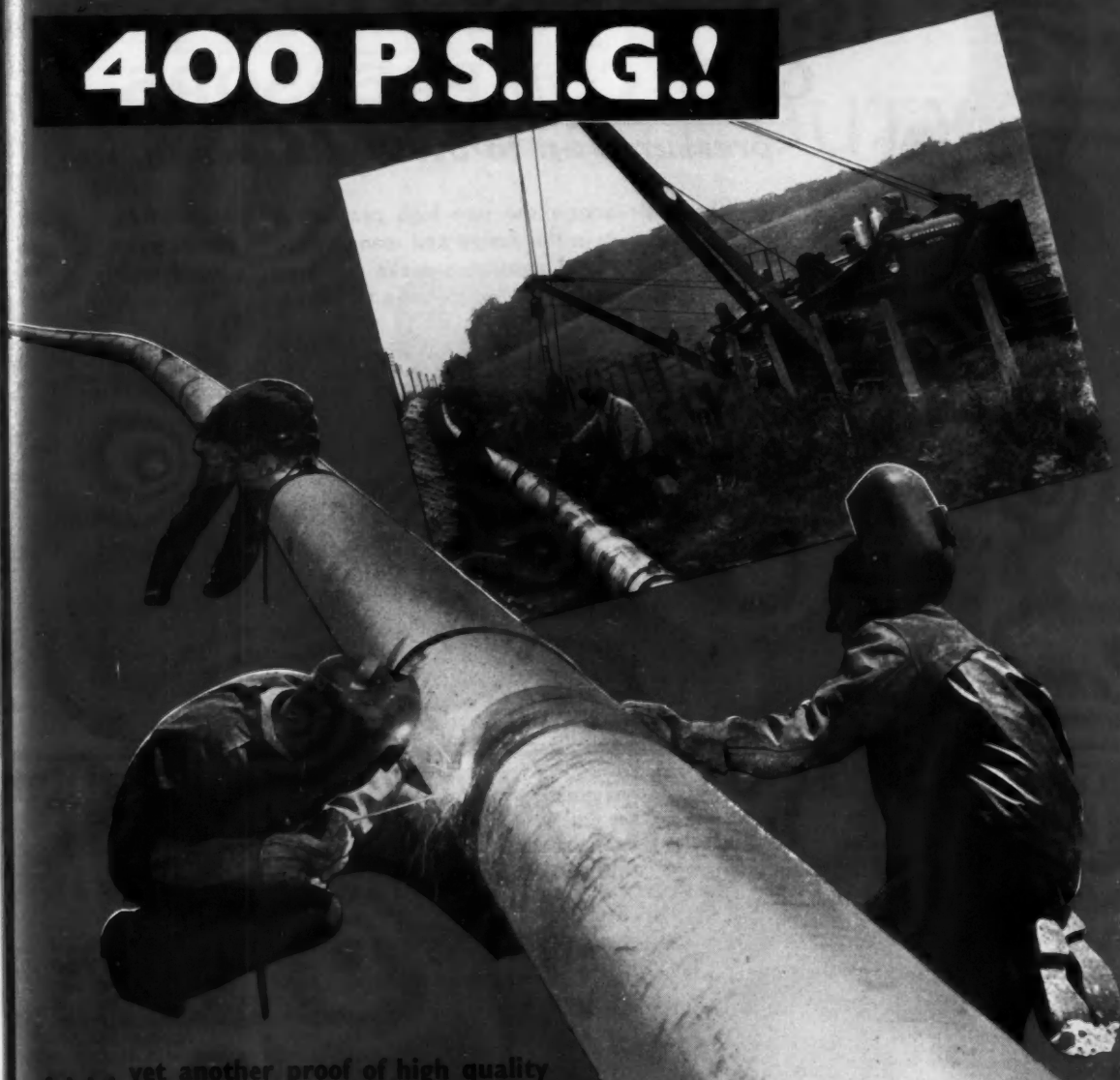
NON-ATMOSPHERIC AND
ATMOSPHERIC TYPES



for COAL GAS
ACETYLENE
BUTANE · PROPANE
NATURAL GAS
METHANE Etc.

GEO. BRAY AND CO., LTD. LEICESTER PLACE, **LEEDS 2**
Tel. Leeds 20981/9 Grams. "Bray Leeds 2"

400 P.S.I.G.!



. . . . yet another proof of high quality work backed by 43 years' experience.

400 P.S.I.G. was the test pressure applied to the new 18" 7,500 yard gas main laid by William Press & Son Ltd. for the North Thames Gas Board at High Wycombe. As it is envisaged that this main will be used as a high pressure holder storing 730,000 cubic feet of gas, the highest degree of workmanship was necessary.

CAST IRON & STEEL MAINLAYING - ALL TYPES OF INDUSTRIAL PIPE-WORK INSTALLATION - PIPE FABRICATION TO LLOYDS' SPECIFICATION

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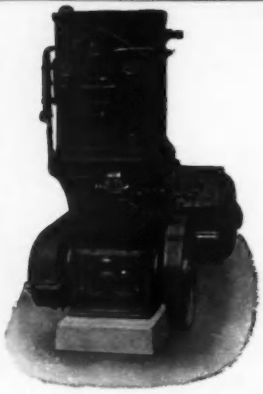
Willoughby Lane, Tottenham, N.17. Telephone: TOTtenham 3050 (12 lines). Telegrams: UNWATER, SOUTHTOT, LONDON.

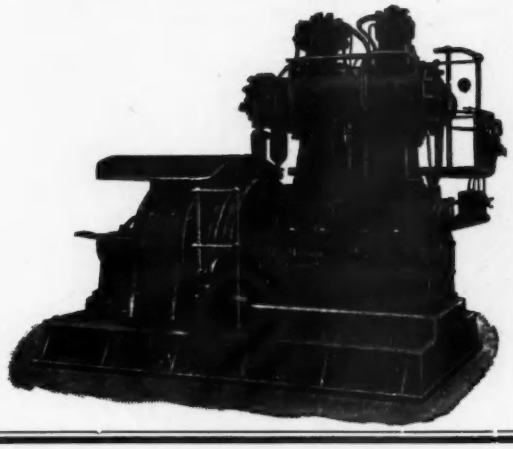


HIGH PRESSURE GAS COMPRESSORS *for*

pressures up to 5,000 lbs. per sq. in.

The illustrations show two high pressure gas compressors. As specialists in the design and manufacture of compressors for both air and gases, we make compressors for a wide range of capacity and pressure up to 5000 lbs. per sq. inch.

The compressor shown above has a capacity of 25 cu. ft. of free hydrogen per minute compressed to 3000 lbs./sq. inch. The illustration on the right shows a four-stage compressor with a delivered capacity of 200 cu. ft. of free town's gas per minute compressed to 5000 lbs. per sq. inch.



For full information regarding gas compressors, write, giving particulars of the duty required, to—

REAVELL & CO., LTD.

RANELAGH WORKS, IPSWICH

Telegrams: "REAVELL, IPSWICH." Phone Nos. 2124 & 2125

COKE DEBREEZING EQUIPMENT

—AT MOND GAS WORKS, TIPTON, STAFFS

★ The West Midlands Gas Board use a C. & T. 60ft. centre Super Mobile Stacker delivering coke on to a C. & T. Skid mounted Debreezing Unit. Stacker is fitted with oversize hopper and fed direct from mobile shovel.

Coke is delivered into the screen hopper then fed on to a mechanically vibrated single deck screen. Oversize material is discharged via either of twin discharge shoots, into railway waggons.

'Fines' pass through the mesh and are collected in storage hopper where it accumulates, prior to discharge into road vehicles.

CAPACITY

30/40

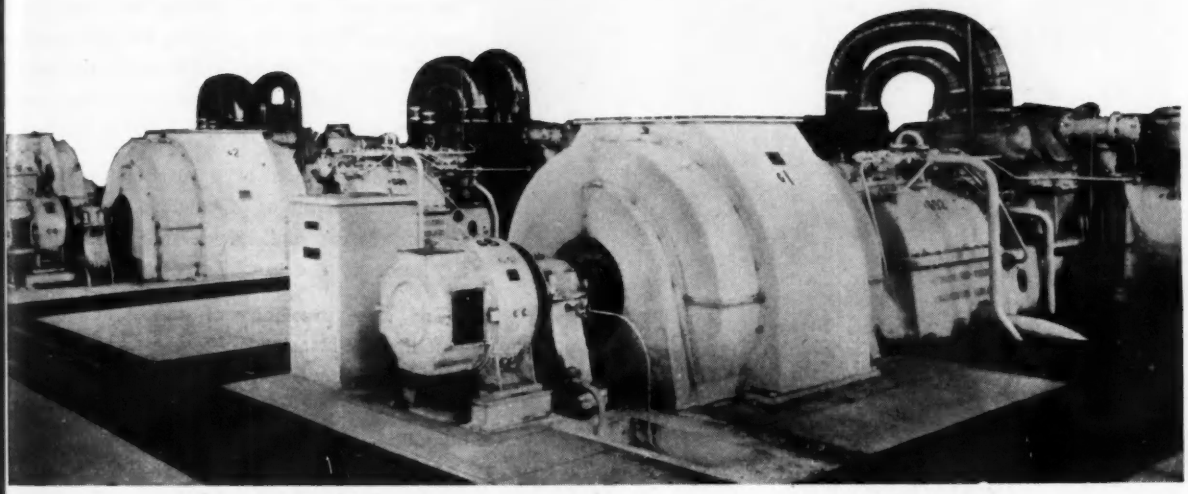
TONS PER HOUR

FULL PARTICULARS ON APPLICATION TO:—

CRONE & TAYLOR (Engineering) LTD.

SUTTON OAK · ST. HELENS · LANCS. Telephone St. Helens 3283

PROCESS STEAM DOES DOUBLE DUTY



with Metropolitan-Vickers Turbo-Generators

Three 3750 kW pass-out turbo-generators have been built by Metropolitan-Vickers for British Enka Ltd.

By adopting Metropolitan-Vickers pass-out turbo-generator sets, many industrial organisations using steam for processes or heating have found it economical to generate electrical power at little additional fuel cost. The company produces condensing and pass-out turbo-sets from 250 to 5000 kW AC or DC. These small power sets have been adopted in paper mills, plastics manufacture, textile production, public utilities, chemical and oil plants throughout the world. Please write for publication 7452/1.

METROPOLITAN-VICKERS
ELECTRICAL CO LTD · TRAFFORD PARK · MANCHESTER 17

An A.E.I. Company

Self-contained Turbo-generator Sets

B/L 204

BUCKLERSBURY HOUSE TO STAND ON

3,500 BORED PILES

This important Office Building in the City o London, 17 storeys high including the basemen floors, is supported on Cementation Bored Piles Approximately 3,500 were constructed well withi the contract time despite the fact that delay were unavoidably occasioned by the deliberation on the fate of the Mithras Temple discovere on the site and other major difficulties inevit able on such a large site.

The construction of a surrounding wall t retain the adjoining Queen Victoria Street Cannon Street and Bucklersbury was greatl facilitated by the use of our bored piles.

The close proximity of important building including the Mansion House and services such a the Underground Railway made it necessary t reduce noise, vibration, etc., to an absolut minimum.

The Cementation Company Limited

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Designed and Manufactured by

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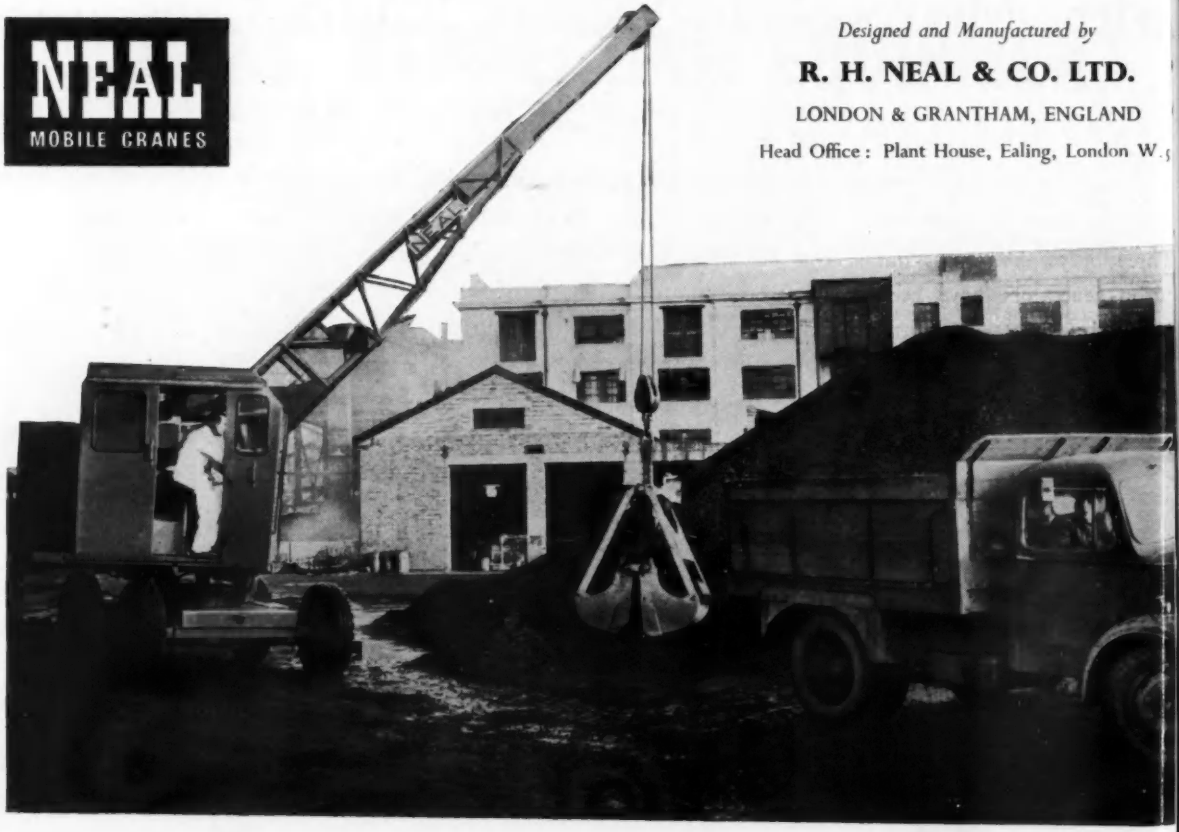


SEGAS plant for catalytic gasification of heavy fuel oil or reforming of L.P. gas.

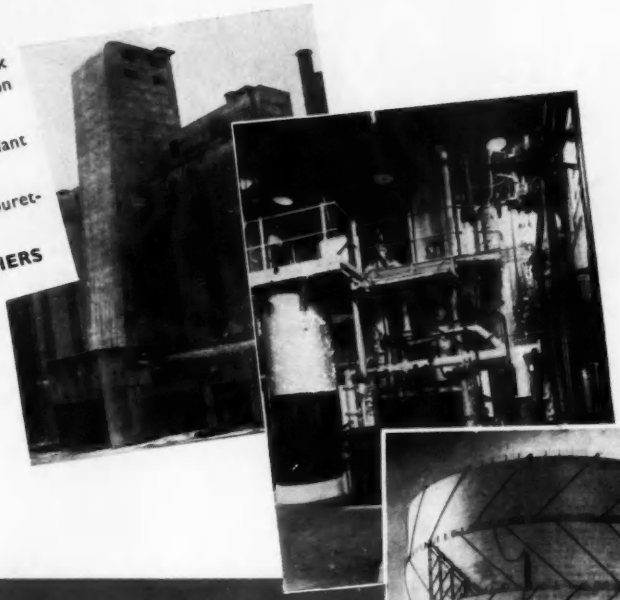
SEMET-SOLVAY plant for high B.Th.U. gas from heavy oil.

HIGH B.Th.U. oil gas plant to crack gas oil or heavy oil for production of gas of high calorific value.

CARBURETTED WATER GAS plant using coke or coal.

HEAVY OIL enrichment or carburetted water gas.

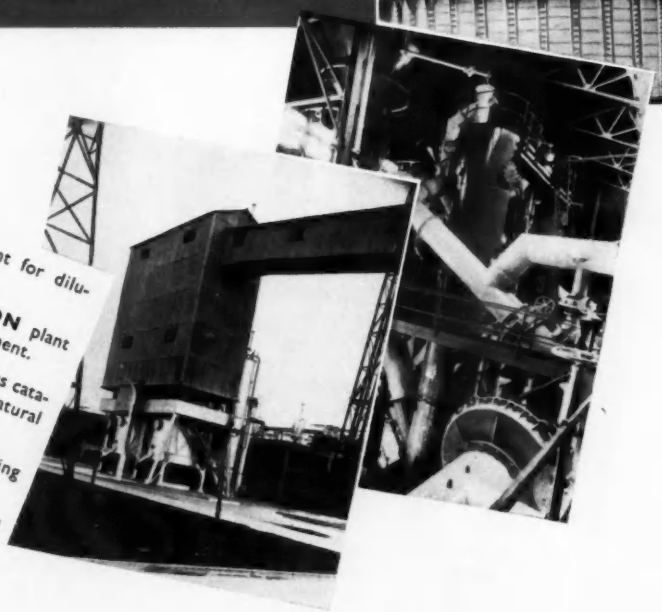
CONDENSERS AND PURIFIERS



PLANT & EQUIPMENT FOR THE

Gas

INDUSTRY



BLUE WATER GAS plant for dilution or direct use.

COMPLETE GASIFICATION plant with or without oil enrichment.

HERCULES plant for continuous catalytic reforming of refinery, natural and L.P. gases.

PRODUCER GAS plant for heating retorts.

GASHOLDERS, column, spiral and Wiggins dry seal.

HEAT EXCHANGERS

302

PGC

THE POWER-GAS CORPORATION LIMITED

AND

ASHMORE, BENSON, PEASE & COMPANY

STOCKTON-ON-TEES AND LONDON

AUSTRALIA · CANADA · INDIA · FRANCE · SOUTH AFRICA

ABP

All round Protection from Corrosion

'HUMIDINE'

NON-SETTING

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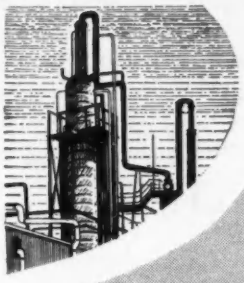

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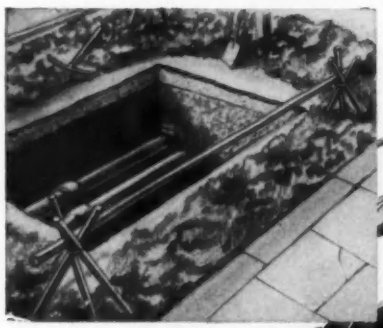

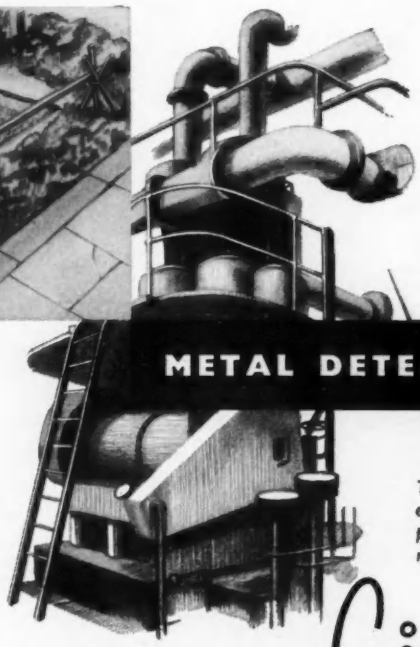

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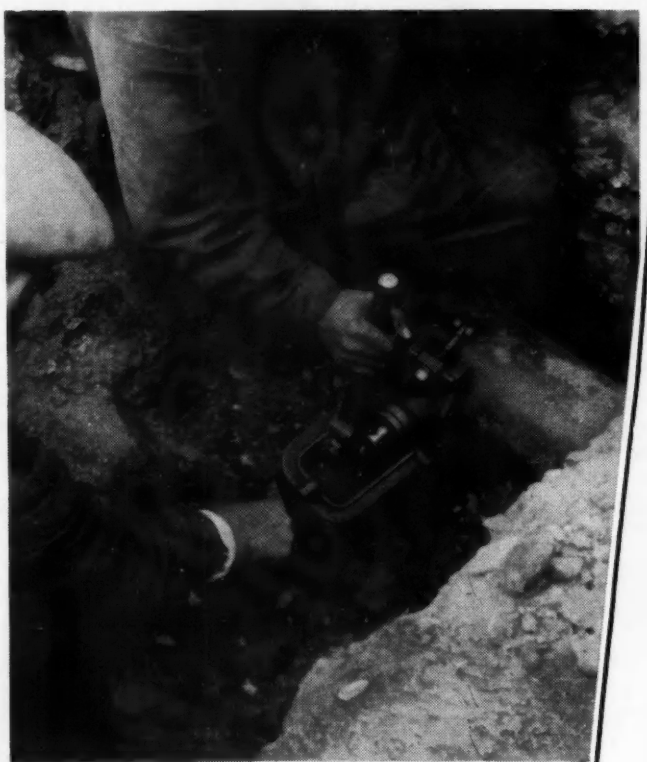

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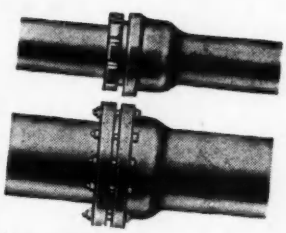

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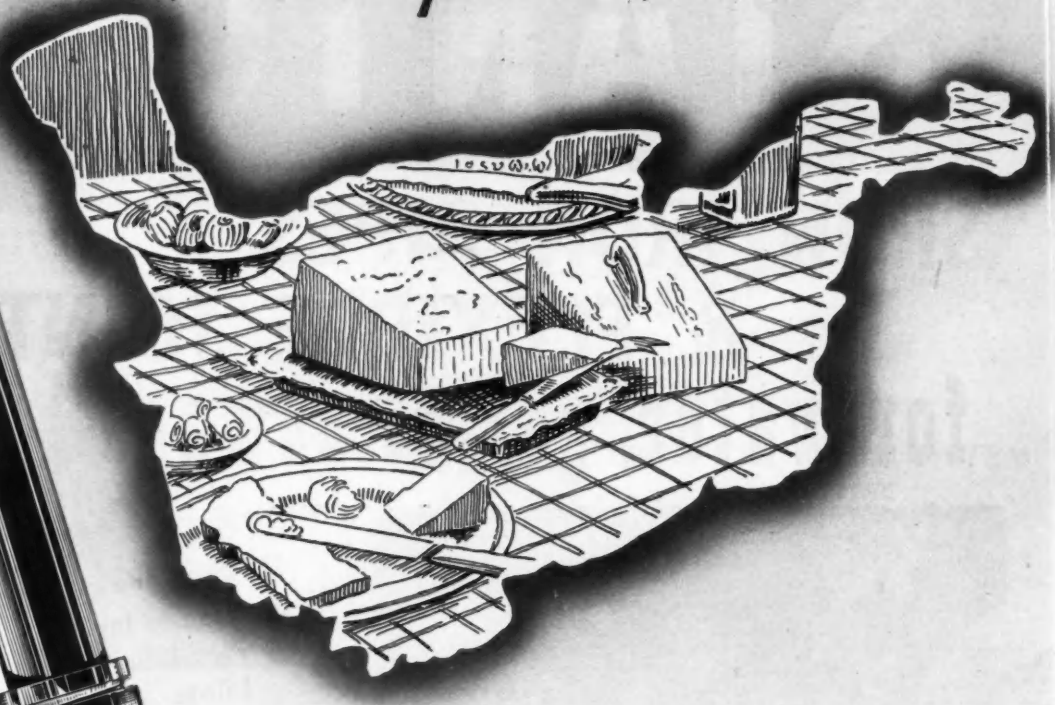

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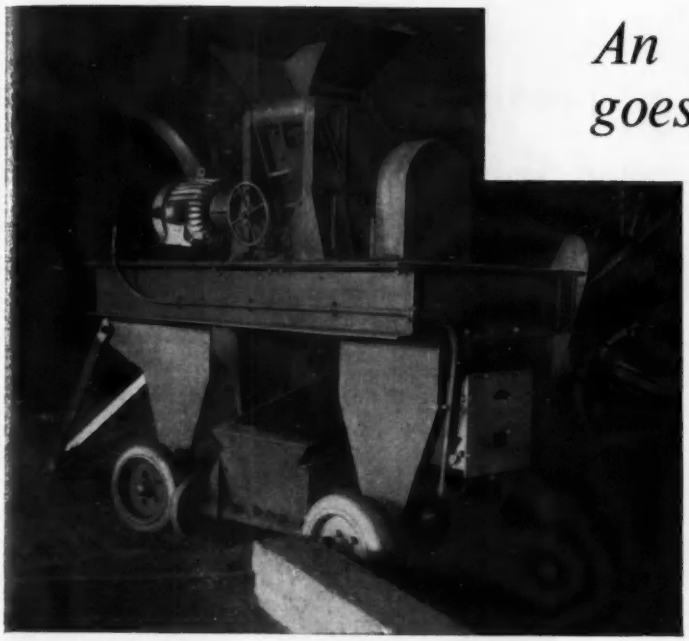

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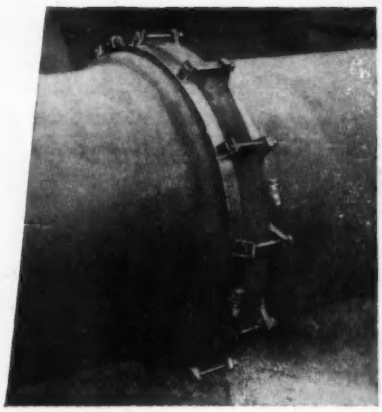

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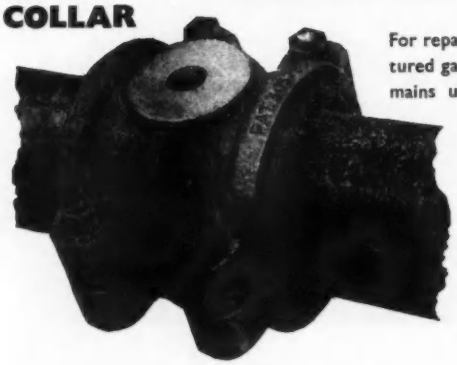

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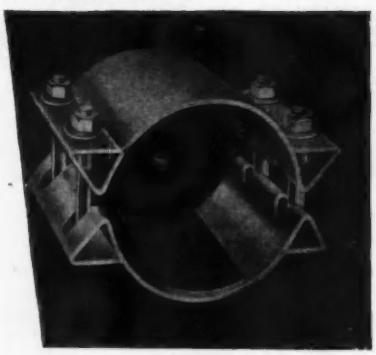

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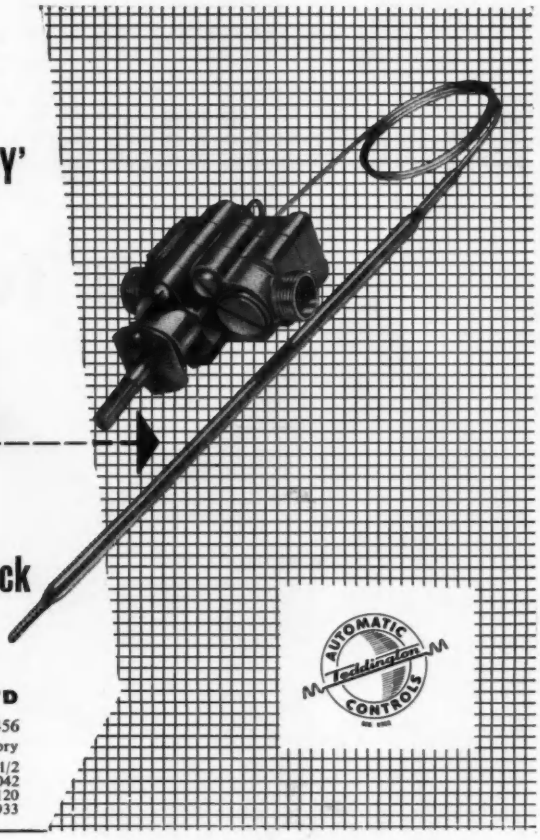

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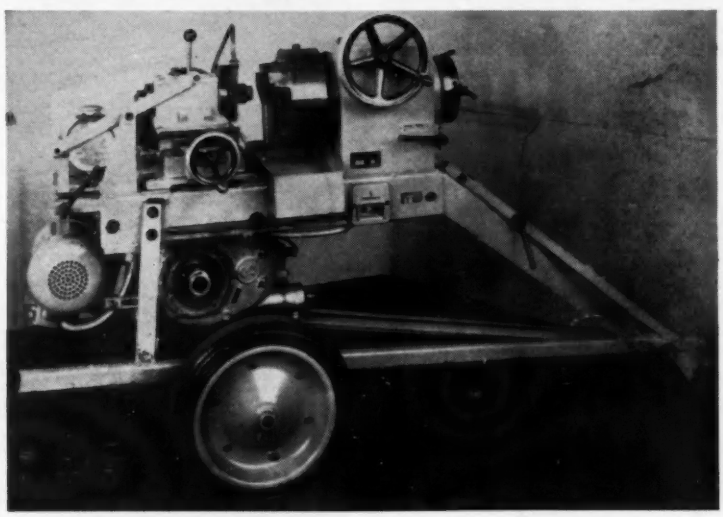

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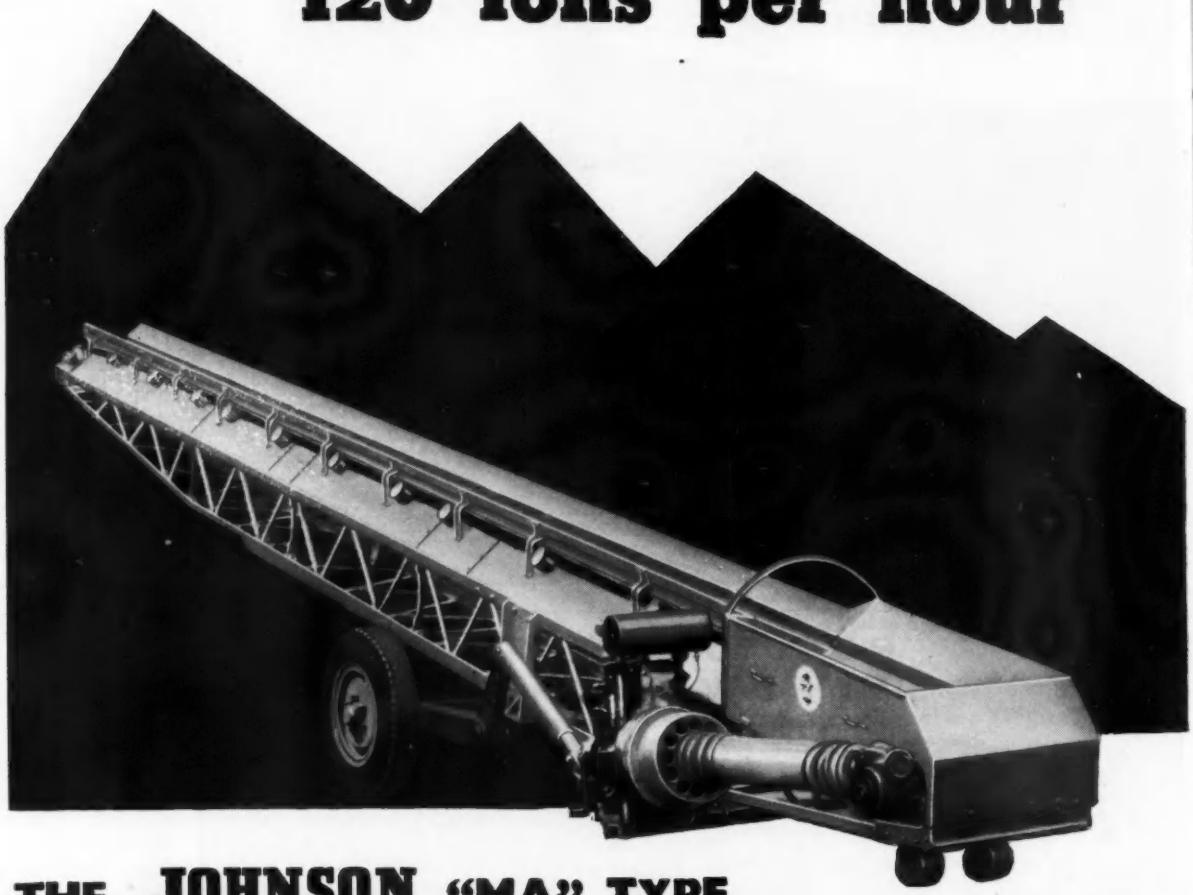

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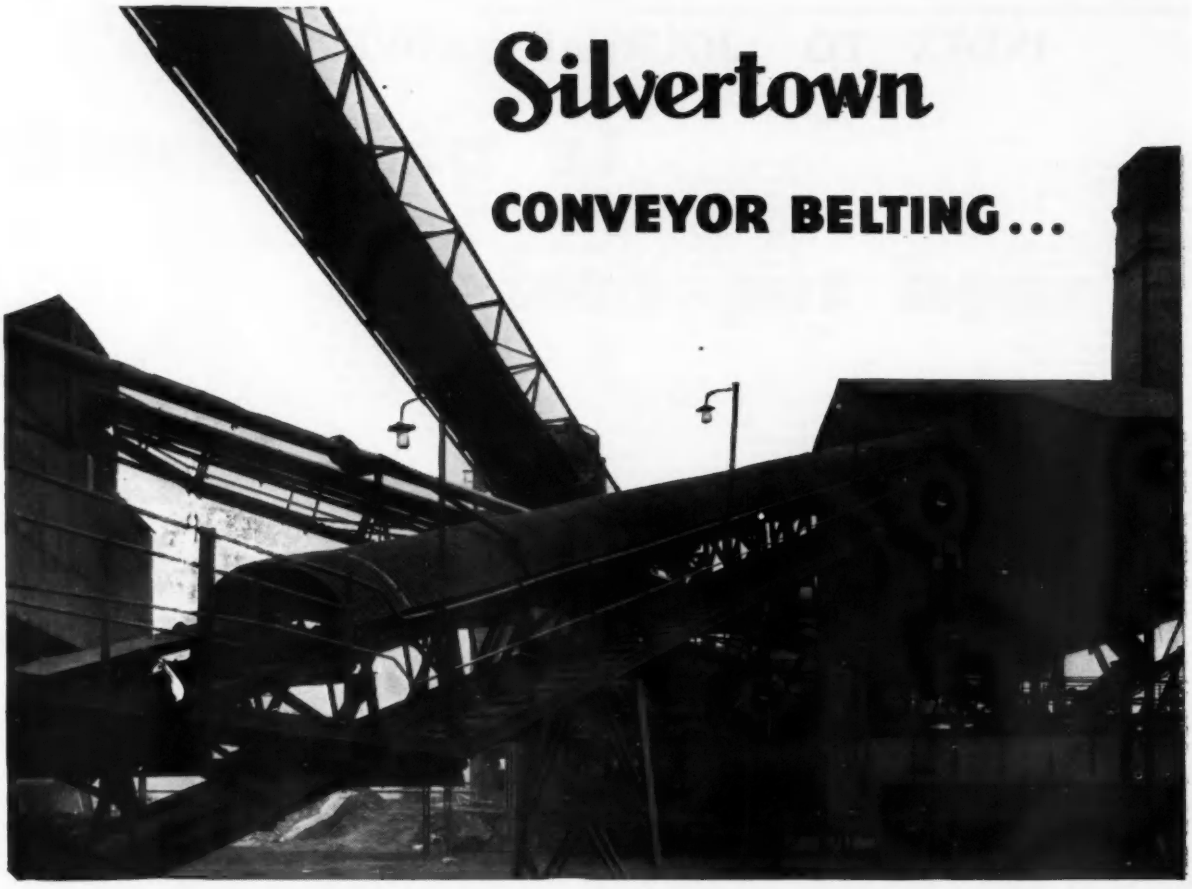

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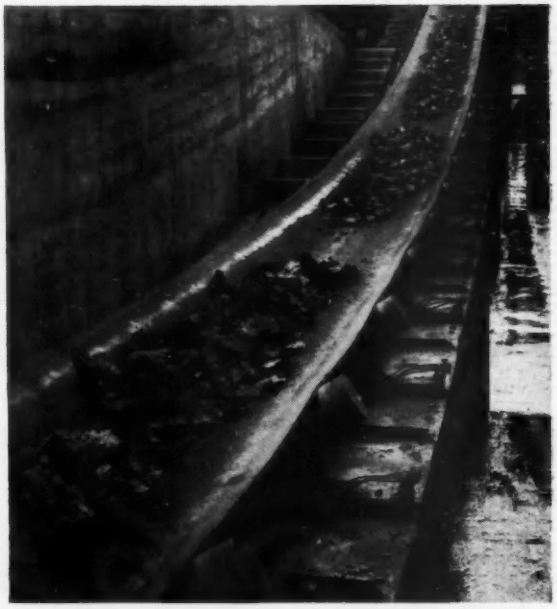

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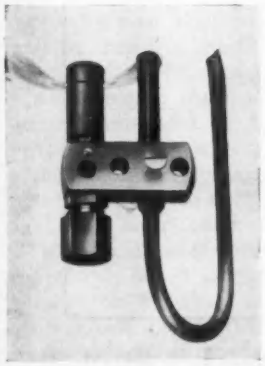

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Gas Journal

VOL. 289 *NO. 4888* *March 20, 1957*

109TH YEAR

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Gas Journal

VOLUME 289. No. 4888. MARCH 20, 1957. 109th YEAR

Gas in Wales

FOR its size Wales is remarkably well endowed with fossil fuels. The South Wales coalfield contains some of the best coal to be found anywhere in the world and in as great variety as can be imagined —the softer, more volatile coal in the Eastern Valleys, through the steam coal seams in the Taff and Rhondda Valleys, to the West Glamorgan anthracites culminating in some of the finest anthracites in Pembrokeshire. In North Wales, too, excellent coal is mined in the Wrexham and Ruabon districts. It is not surprising, therefore, that industry should have been developed so extensively on the South Wales coast within easy reach of these fuel supplies, nor is it difficult to imagine how quickly the dock facilities expanded with the increase of the demand for these fuels by countries abroad during the last half of the nineteenth century. But these industries were all heavy industries—coal mining, iron and steel making, non-ferrous metal smelting and tin plate manufacture. During the depression of the early 1930's they were particularly hard hit and it was not until the Government-sponsored trading estates came into being that light industry began to make its appearance in industrial Wales. When these had been firmly established both just before and after the war, industry in the industrialised parts of Wales became reasonably well balanced for about the first time in its history since the Industrial Revolution.

Between this now prosperous South Wales industrial belt and the industrial North Wales of Flintshire and East Denbighshire the scattered population and completely rural outlook has made agriculture almost the only industry tempered by the holiday resorts on the North Wales coast and Cardigan Bay.

This then is the background against which the Wales Gas Board had to set to work to collect all the separate undertakings to be found in the Principality on vesting day in 1949, and place them under a co-ordinated central authority based in Cardiff. The manufacturing stations were on the whole small, although the largest had a capacity of about 2,000 mill. cu.ft. per year and in many cases the standard of maintenance after the war was low.

Now that the type of industry in Wales was properly balanced and more prosperous than it had been for many years, there were available to the Wales Gas Board's planners both producers of gas as well as possible large industrial consumers of gas. The types of coal found in the centre of the South Wales coalfield had for many years been used for the manufacture of metallurgical coke, and this had been practised on a large scale, making available large volumes of coke oven gas as a by-product. Although this had been absorbed by certain gas undertakings before the war to a limited extent, notably by the Rhymney and Aber Gas Company, and the municipal undertaking of Pontypridd, the greater prosperity of the steel companies was encouraging the building of larger coke oven plants and the amount of gas available was steadily increasing. This was true of South Wales and to a much smaller extent North Wales, where the only source of coke oven gas is the large steel works at Queensferry. Here an up-to-date coking plant has been built since the war which supplies crude gas to the North Wales grid.

With all this in mind, it is particularly interesting to study the two papers published in this issue, one an address by Mr. E. M. Edwards, a member of the Wales Gas Board, to the Eastern and Western Sections of the Scottish Juniors, and the other by Mr. Alan Yates of the Wales Gas Board staff, to the Wales and Monmouthshire Juniors. Mr. Edwards' address deals largely with the fundamental issues which would face any planning authority which had been set the task of reorganising gas supplies in any such area. Mr. Edwards gives the reasons why the two grid systems were adopted for South and North Wales and the explanation which he gives is that the cost of manufacturing and laying pipes, and of buying and installing compressors, had increased to a smaller extent than the building of an up-to-date gasworks complete with storage capacity. This was indeed fortunate because with so much potential fuel to hand which only needed collecting and conveying to the consumer, it would have been a pity indeed if the converse had been true. The South Wales grid has been divided into two sections, the Eastern and the Western. The latter section is in the somewhat more rural parts of West Carmarthenshire and South Pembrokeshire which would have a lower load factor than the remaining part of the grid, but it should permit a suitable con-

nection to the gas supplies to be taken from any developments in oil refining at Milford. This would be the logical outcome of the Board's policy of taking gas supplies when and where they are offered.

Mr. Yates, in his paper, shows how very original the Wales Gas Board have been in the last few years. Not only have they taken in all the available coke oven gas to fill their grid mains, but since, as might be expected, the Board as a whole is running short of gas coke and would have to buy coke for producers, they are testing the use of non-coking low volatile coal in water gas and producer gas plants. To improve the load factor on their mains from the coke oven plants, tests have been done on the reforming of coal gas for retort heating. Their experiments in methane drainage in North Wales have reached the point where by making use of an Onia-Gegi plant for reforming and a water gas plant for producing a diluent, large volumes of mine gas are being dealt with daily and are being distributed through the North Wales grid.

Such then have been the efforts of a small gas board with comparatively small sales of gas (less than 80 mill. therms a year in 1953), and with a population of 2.588 mill., half of them in the industrial south. The output of gas is little more than that of the Liverpool Group of the North Western Gas Board, but it speaks volumes for the Board's vitality and breadth of vision that it has not been daunted by its extremely formidable task of co-ordinating an area of 8,000 square miles with a population anything but uniformly distributed, and that it continues to make an annual surplus.

The Cost of Air Pollution

IN the 'GAS JOURNAL' of December 19, 1956 (p. 696) we gave our own reactions to Dr. Scorer's provocative and, as Mr. Nonhebel put it, stimulating paper. The Institute of Fuel has now published in its own Journal a generously full report of the lively debate which followed its presentation. The debate was amusing as well as lively but destructively rather than constructively critical. Dr. Scorer stood up to it pretty well. True, he still did not attempt to establish in any 'scientific' way the weighting factors upon which the bone of contention, Table I, was based. 'He dumbfounded everyone by putting down numbers without any supporting statements.' It was in this table that he announced 'the shocking figure of £210 mill.' ('£6 per ton of coal used'—we are glad to have this opportunity of correcting our verbal slip!) as the estimate of the damage wrought by the open domestic coal-burning fire—and that out of the total of £250 mill. by all sources of smoke.

Well! even Mr. Arnold Marsh, who has probably as much right to guess as anyone, thought it might be as much as £150 mill., while Dr. Scorer maintained that he had enough 'observational experience and theoretical knowledge to make a guess that was not misleading.' At any rate he was right in pointing out that it was not a fuel technologist but Dr. W. C. Turner, who one infers must be a health officer or at least a medical man, who reminded us of the real reason why the use of bituminous coal in the open fire does so much damage. Over a very large fraction of the life of a charge of coal on the fire it gives off the products of low temperature carbonisation, including most of the tarry vapours, which are not consumed but are ejected into the atmosphere at a very low level and distributed over the surrounding property and people. Dr. Scorer's study with its 'empirical and unbiased approach' had drawn attention in a dramatic way to the overwhelming importance of the air pollution from domestic sources—and there could be little doubt that this pollution was paramount in giving rise to health problems—in our cities.

Probably our fuel technologists were correct in their attitude to this far too dogmatic (almost flippant) approach to a desperately important question. And yet, as Mr. Lucas put it, audacious men are not always wrong. Mr. Lucas promised that he and a colleague would shortly publish results of an enquiry into the matter of pollution by domestic chimneys in comparison with pollution from power stations in the particular conditions of an inversion, and he believed that their figures would make Dr. Scorer's estimates appear cautious rather than startling. The publication of these results will be awaited with a great deal of interest.

A point which arose again in this engaging debate was the relative innocuity of sulphur in atmospheric effluent in the absence of carbonaceous matter. Yet while this to some extent negatives one of the objections to the use of coke and gas for domestic heating purposes it does not reduce the ultimate desirability of getting the sulphur content, particularly of gas, down to the lowest practicable figure. The question of the removal of organic sulphur seems to have receded into the background during recent years. It is being seen that in the present climate of high coal prices it is possible to sell some special 'cokes' at a higher price than the straight high temperature product. Is it not time that we looked again at the question whether gas would not stand the relatively small increase in selling price necessary to implement the slogan 'Sulphur must go'?

This Will Shake You!

A CONTRIBUTOR writes to a certain journal to say that he recently purchased a gas cooker. He gives as his reasons: 'I do know that, apart from a general failure of the gas supply, my wife will be able to complete all her cooking without the fear of an oven failure, the grill, or the hot-plate burning out, the possibility of the door jamming, due to warping under heat—a fault in cooker "A"—or the handle clasp expanding and holding the door shut, under heat—a fault in cooker "B."

'The burning out of the elements cannot be avoided, but the other faults can.

'Again, I know of consumers waiting two or three days for "service" on electric cookers. The service call has been passed on, but the serviceman's comment is often: "She'll be lucky!" or "She won't get that done till Monday!" and the consumer, who has bought a cooker, possibly on the advertising merits, is left to manage during the interim period as best she can.

'No electric cooking for me. Mr. Therm has a strong point in saying that he never let London down. The service on electric cookers does, often.'

The writer, of course, a member of the gas industry? The journal, the mouthpiece of the gas industry?

Wrong! The writer is an employee of the 'nationalised electricity service,' as he puts it. The journal which gives him space is the *Electrical Times*! It shakes you, doesn't it?

LARGE SCALE ADMIN. CHANGE IN SCOTTISH GAS INDUSTRY

A MAJOR administrative change in the structure of the Scottish gas industry is made this month by the Scottish Gas Board. The country will have five divisions, each under the control of a general manager, in place of the ten principal administrative units as formerly. The most significant change is in the west of Scotland, where extensive regrouping has taken place. The new divisions, with their general managers and areas of jurisdiction, are:

Northern: MR. H. S. MILNE, at present Northern Divisional Controller, Aberdeen—the area covered by the present Northern Division.

Central: MR. W. NICOL BAIRD, at present Group Manager, Perth—the areas covered by the present Fife, Perth, and Dundee Groups.

Glasgow and Western: MR. H. R. HART, formerly Manager of the Glasgow Division—the areas covered by the former Glasgow and Lanarkshire Division and those parts of the former Western Group supplied from Paisley, Renfrew, Barrhead, Johnstone, Port Glasgow, Greenock, Skelmorlie, Campbeltown, Dunoon, and Rothesay.

Edinburgh and South Eastern: MR. DAVID BEAVIS, at present Edinburgh Divisional Controller—the areas covered by the present Edinburgh and South East Divisions and that part of the present Kilmarnock Group supplied from Moffat and Langholm.

South Western: MR. A. JAMIESON, former Western Group Manager, Greenock—the areas covered by the former Western and Kilmarnock Groups, excluding those parts assigned to the Glasgow and Western Division and the Edinburgh and South Eastern Division.

The change-over is already in operation in the west. The changes will become effective in the other areas on March 31, at the end of the Board's financial year. It will be seen that the Northern and Central Divisions remain unchanged territorially. The Glasgow and Western Division now takes in the whole of Argyllshire, instead of only part, and has had added to it the former Lanarkshire Division (excepting Shotts), Renfrewshire, the Rothesay undertaking of Buteshire, the areas served by the Skelmorlie undertaking in Ayrshire, and also the Kilbirnie, Beith, and Dalry areas of Ayrshire. The reason for the abolition of the Lanarkshire Division was the possible development of supplies of coke oven gas from Lanarkshire. It was considered advisable to increase the area of the Glasgow Division and bring those areas supplying coke oven gas under the general management of that Division.

Divisions will operate on a functional basis under six heads. In the Glasgow and Western Division the appointments are: Controller of Production and Technical Services—MR. J. A. FERGUSON, Divisional Constructional and Maintenance Engineer, Glasgow. Controller of Sales—MR. A. MCFADYEN, District Manager, Dumbarton. Controller for Finance and Administration—MR. J. A. AULD, Ford Motor Company. Controller of Stores, Purchasing, and Transport—MR. J. D. BRANDON, Divisional Manager, Sheffield and Rotherham. Manager of Organisation, Research, and Planning Section—MR. H. A. BURNS, Research Officer for the National Coal Board, Edinburgh. Personnel, Welfare, and Training Officer—MR. J. R. JOSLIN, Civilian Labour Officer, B.A.O.R.

MR. J. M. DOW, the first (and, as it turns out, the last) Divisional Controller of Lanarkshire, has joined the headquarters staff of the Board in Edinburgh, with special responsibility for coal and by-products.

The old South Western Division has also been severely affected by the loss of the Lanarkshire, Renfrewshire, and Buteshire areas which have been transferred to Glasgow, and also a small part of the Dumfriesshire area which has been transferred to Edinburgh. The present South-East Division will be abolished on March 31 (when it is joined to Edinburgh), and the South-East Controller, MR. D. J. COLVIN, will take up an appointment as General Manager of the area maintenance and construction department, with special responsibility for production and distribution in the smaller undertakings.

The reorganisation has also affected the constitution of the Scottish Gas Consultative Council. It is now intimated that the Minister of Power has approved the enlargement of the Glasgow and Western District Committee to 30 members because of the size of the area now covered.

Distribution Engineer of the Lanarkshire Division of the Scottish Gas Board since 1954, MR. ANDREW MITCHELL has been appointed to the same post with the newly-formed Glasgow and Western Division, into which Lanarkshire has been merged under a reorganisation scheme. After holding managerial posts at Haddington, Buckie, and Penicuik, Mr. Mitchell went to Lanarkshire in 1946 as Distribution Engineer of the former county gas undertaking. He received his early training at Dunfermline Corporation's gasworks and studied gas engineering at Heriot-Watt College, Edinburgh. He is a corporate member of the Institution of Gas Engineers, and holds the Institution's diploma in gas manufacture.

Personal Notes

CORRESPONDENCE

Pensions (Increase) Act

DEAR SIR,

We have noticed that reference was made on page 505 of your issue dated March 6, to action allegedly taken by the National Joint Council for Gas Staffs in respect of the application of the Pensions (Increase) Act, 1956, to ex-company pensioners of the gas industry. We would like to point out that this action was taken by the Staffs' Side of that Joint Council only, in conjunction with the Workers' Side of the National Joint Industrial Council and the Officers' Side of the Senior Gas Officers' Joint Council, and not by the National Joint Council for Gas Staffs as such.

Yours faithfully,
R. MOYLE,
Employers' Side Secretary.
G. W. PHILLIPS.
Staffs' Side Secretary.

National Joint Council for Gas Staffs,
Murdoch House,
1, Grosvenor Place,
London, S.W.1.
March 13, 1957.

Deputy Chairman Celebrates 50 Years Unbroken Service

MR. R. S. SNELLING, Deputy Chairman of the Wales Gas Board, celebrated 50 years' continuous service in the gas industry on March 10. Mr. Snelling has held his present post for the past eight years. He joined the Newport (Mon.) Gas Company (as it then was) on March 1, 1907, as a very junior clerk and in 1931 he became Assistant Secretary. Promotion to Secretary came in 1938, and one year later Mr. Snelling combined this post with that of General Manager. His interest in industrial relations began to come to the fore about this time, and he started to play a prominent rôle in the national and regional councils of the gas industry. He has worked keenly on these ever since, and his sound judgment is greatly respected by his colleagues. Mr. Snelling became General Manager of the Severn Valley Gas Corporation, Ltd., and Gas Consolidation, Ltd., in 1943, and was also made a director of some 40 gas undertakings. He was appointed to his present post by Mr. Hugh Gaitskell, now leader of the opposition and at that time Minister of Fuel and Power, in December, 1948. Mr. Snelling was made a J.P. for his home town of Newport in 1943, and for 12 years has been Chairman of Newport Justices' Advisory Committee. He has been President of Newport Chamber of Trade and Chairman of the local Rotary Club reconstruction committee. A keen sportsman in his younger days, he was captain of Newport Athletic Club's tennis team in the early 1930's.

CLEAN AIR AND THE SUPER-COKES

'No Advantage with the Modern Grate'

GAS COUNCIL CHIEF AT YORKS FORUM

CARE must be taken to make clear to local authorities that specially reactive cokes produced by some boards do not represent the gas industry's alternative smokeless solid fuel to replace bituminous coal for use in open domestic appliances.

This fact was expressed by Mr. J. O. Cooke, Coke Officer of the Gas Council, at a recent Yorkshire Juniors meeting held at Bradford. An open forum was discussing the effect of the Clean Air Act on the gas industry.

Standards Preparation

Mr. Cooke said that standards for domestic coke quality were being prepared by the B.S.I. 'We in the gas industry are preparing proposed specifications as a basis for discussion by the B.S.I. If and when they are published any gas board will be free to use them at all works or at selected works or not at all as they deem fit.'

Specially reactive cokes setting at a premium over ordinary cokes were already being marketed by some boards —cokes made by adaptation of carbonising processes and by the use of special coals.

Mr. Cooke went on: 'Like Coalite they have undoubted advantages, particularly for users with old fashioned coal burning grates who don't want to change.

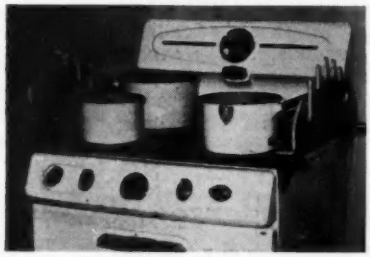
'With modern coke burning fires they show no advantage over ordinary coke. In operation they are no more efficient and certainly are no more economical.

'The total tonnage of these special cokes is small compared to the ordinary cokes produced by the gas industry and care must be taken to make it clear to local authorities that they do not represent the gas industry's answer to the supply of an alternative smokeless solid fuel to replace bituminous coal for use in open domestic appliances.'

The Juniors' President, Mr. R. H. Anderson, also invited contributions to the forum from Mr. H. Johnston, Chief Engineer, N.E.G.B., Mr. N. Hudson, Chief Commercial Officer, N.E.G.B., and Mr. L. G. A. Leonard, General Manager of Dowson and Mason, Ltd., of Levershulme, Manchester, to discuss the new Act. Mr. D. G. Wilson, Coke Officer to the N.E.G.B., gave some observations on the probable effect of the Act on coke sales in the area.

Discussion

Seventy members attended the meeting, and among those who took part in the discussion were Mr. F. C. Barker, Mr. G. Griffiths, Mr. J. Hargreaves, Mr. D. C. Henderson, Mr. A. C. Bloomfield, Mr. T. Ward, Mr. J. H. Barrett, Mr. J. Edgar, Mr. T. A. Marriott, Mr. F. Firth, Mr. A. Wilkinson, Mr. J. Blackburn, and Mr. S. A. Crewdson.



The safeguard in use on a Flavel gas cooker. It has been desiged to fit domestic cookers with hot plate area dimensions of between 24 in. by 19 in. to 19½ in. by 17 in. The principal components consist of two side plates; a bent rail riveted into the side plates; front and rear brackets; four jaws which locate on to telescopic barrel nuts (to effect contraction); a mushroom pad (an oil-resisting neoprene buffer which is fitted into the jaws); and a mild steel rail, threaded at each end, which screws into barrel nuts to adjust length.

Mrs. Mann likes this sort of enterprise

'I LIKE private enterprise when it is really enterprising,' Mrs. Jean Mann, Labour Member of Parliament for Coatbridge and Airdrie, told a Press conference at Brown's Hotel, London, on March 13, when the 'Crayleigh' safeguard—designed to prevent spillages from a domestic cooker—was introduced.

Mrs. Mann, who is Joint Secretary of the Parliamentary Committee of the Society for Prevention of Accidents in the home, and also a Vice-President of the Royal Society for the Prevention of Accidents, said that she had herself tested the gadget, which holds saucepan handles securely in slots, in the offices of the North Thames Gas Board, and found it satisfactory in every way.

She pointed out that while large amounts of money were being spent on the prevention of road accidents, the small grant of £1,500 allowed towards the prevention of accidents in the home was going to be stopped at the end of next year. She went on to say that while cookers were tax-free, the safeguard would be subject to 13s. 8d. purchase tax.

Mr. Lewis, financial adviser to Crayleigh Safeguard Products, Ltd., marketers of this gadget, said the new invention had won first prize in television Inventors' Club, of which Mr. Leslie Hardern, of the North Thames Gas Board, was Chairman.

'Gas Journal' Staff Photographer Stephen Tennant, A.R.P.S., has had colour transparencies dealing with the coking industry and agricultural subjects accepted for the Royal Photographic Spring Exhibition of Applied Photography.

Million - pound Scottish Improvement Plans Concentrate on Grid Schemes

THE Scottish Gas Board is preparing to spend close on a million pounds on plans to improve existing services in Scotland. During the last three months four-figure projects approved by the Board amount to £976,401, the greater part of it representing grid schemes to be carried out in various parts of the country.

The divisional projects and their estimated cost are as follows:—Central Division, £463,711; Glasgow, £258,576; Edinburgh and South-East, £154,305; Lanarkshire and South-West, £37,699; South-West, £32,210; Glasgow and West, £28,450; Northern, £1,450.

CENTRAL DIVISION

Two grid schemes are revealed in the list of projects to be undertaken in the Central Division, one in Fife and the other in Angus.

The grid mains system to be constructed in the county of Fife envisages the centralisation of gas production at certain selected gasworks and the cessation of production at inefficient and uneconomic works. One of the central points will be Dunfermline, and the first stage of the constructional programme includes the re-building of carbonising plant at the works there and the laying of grid mains from Dunfermline to Cowdenbeath, Lochgelly, Kelty, Kinross and Cardenden. This will enable increased quantities of gas to be produced at Dunfermline works for trans-

(Continued on p. 613)

Gas Sales Increased £15,000 in the Isle of Man Last Year

A 'sounder position than for some years' was the verdict given to shareholders of the Douglas Gas Light Company at the annual meeting by the Chairman, Mr. W. S. Waid.

But, he added, costly renewals would be necessary in the near future. To meet this the renewals fund was at its maximum of £14,280 permitted by the Gas Regulation Act, but this was not nearly high enough in the light of present-day experience, and it might be necessary to consider making application for approval of a higher maximum.

Sales of gas and residual products showed an increase of £15,373, and the total revenue for the year was £183,772, against £168,398 the previous year.

The manufacture of gas had cost £6,950 more, and coal £9,000 more, but there was a net profit of £12,405, an increase of £2,977. Adding a balance of £6,499 brought in there was available £18,904 subject to an interim dividend payment of 7d. per share made in September, which absorbed £4,165.

Approval was given to a final dividend of 9.8d. per share, which would require £5,831 and leave a balance of £8,908 to carry forward to the new account.

EDINBURGH'S LEGAL CLEAN AIR ZONE

Industrialists Are Chiefly Affected

EDINBURGH has now got a legally prescribed smokeless zone —an area of 250 acres comprising the Sighthill industrial estate and adjoining recreation ground.

A Corporation order for this development in the city's wider plan to reduce atmospheric pollution came into force this month after being approved by the Secretary of State for Scotland.

Under the terms of the order the Corporation can take proceedings against any occupant of property in the area who causes emissions of smoke, but those concerned at this stage are nearly all industrial firms with up-to-date buildings equipped with appliances for the use of smokeless fuel.

It is intended at a later stage to extend the smokeless area to include virtually all the houses in the Sighthill area.

Most of the houses belong to the Corporation and are provided with special grates suitable for smokeless fuel. The general principle adopted by the Corporation was to install one grate for solid smokeless fuel and install in the rest of the house points for gas and electricity appliances.

SHEFFIELD DISTRICTS TO HAVE NAMES

IT has been decided to discontinue the numbering of Districts in the Sheffield and Rotherham Division of the East Midlands Gas Board.

In future, the Districts are to be known by the following names:

Old Numbers	*New Names*
No. 1 District	Sheffield District.
No. 2 ,,	Rotherham ,,
No. 3 ,,	Barnsley ,,
No. 4 ,,	Dearne Valley ,,
No. 5 ,,	Doncaster ,,
No. 6 ,,	Worksop ,,
No. 7 ,,	Matlock ,,
No. 8 ,,	Beighton ,,

Another Federation Branch is Formed

The first branch in North Wales of the Women's Gas Federation was formed on March 7 at Connah's Quay, where the inaugural meeting was held at the Gas Service Centre.

The officials of the newly-formed Deeside Branch (initial membership 45) are: Chairman, Councillor Mrs. M. E. Edwards; Vice-Chairman, Mrs. R. O. Roberts; Secretary, Miss H. S. Lakey; Assistant Secretary, Councillor Mrs. I. Fellows; Treasurer, Mrs. H. I. Williams.

Will You Receive Technology Diploma?

THE National Council for Technological Awards have announced that the following courses now in progress have been recognised as leading to the Diploma in Technology:

Colleges:	*Full-time Courses:*
Battersea Polytechnic	Applied chemistry Chemical engineering Mechanical engineering Civil engineering Electrical engineering Metallurgy
	Sandwich Courses:
Acton Technical College	Applied chemistry Applied physics Electrical engineering Mechanical engineering
Battersea Polytechnic	Applied chemistry Chemical engineering Electrical engineering Mechanical engineering Metallurgy
Birmingham College of Technology	Applied chemistry Chemical technology Applied physics Electrical engineering Mechanical and production engineering
Cardiff College of Technology and Commerce	Mechanical / production engineering
Woolwich Polytechnic	Electrical engineering Mechanical engineering

News in Brief

CLEAN AIR ACT HAS TOO MANY LOOPHOLES, SAYS FUEL CHIEF

SPEAKING at the annual dinner of the Yorkshire Section of the Institute of Fuel at Leeds, recently, Mr. J. B. Rylands, President of the Institute, expressed the fear that local authorities might not be able to implement the full provisions of the new Clean Air Act.

He said that the general strike of 1926 had revealed Leeds in all its beauty. They could see it like that again if they were prepared to pay the price; but he was afraid the Act had too many loopholes.

Radiation Profits Drop £490,000

GROSS aggregate profits for 1956 of the Radiation Group were £491,286 against £982,197 in 1955. Tax takes £257,713 (against £542,715), leaving a balance of £233,573 (£439,482).

Payment of Ordinary dividend for the year of 7% actual, less tax, is recommended.

Prize of a 2½ cu.ft. capacity refrigerator, donated by the Scottish Gas Board, is one of the many being offered as an inducement to the public to join in Glasgow's month-long X-ray campaign. All who go for an X-ray examination in this T.B. campaign will be eligible.

Value of gas and coke appliances sold by the North Western Gas Board in January was £194,421 against £207,493 in January, 1956, a fall of 6.3%. So far this year, sales are about the same as last year.

Ossett Council is investigating the possibility of making a smoke control area within the Borough to include an estate of 170 municipal houses to be erected at Broadowler.

The mobile tea bar pictured here is spending up to a fortnight at each of the principal showrooms of Watford Division of the Eastern Gas Board. Customers are offered a free cup of tea, made in an ordinary domestic teapot, using water straight from the spout of an Ascot 509 boiling water heater. All enquiries about the heater are followed up by the home service adviser running the bar or by sales staff. The bar was made in the Division's display section.

Attack on Consultative Councils: 'Not Sufficiently Alive to Waste'

CATERER WANTS DIRECT REPRESENTATION

BOTH gas and electricity industries came in for sharp criticism at the meeting of Merseyside branch Catering Managers' Association, when it was suggested that caterers ought to have direct representation on consultative councils. Mr. D. Francis Davies (Secretary) said gas and electricity boards must take a large part of the blame for rising overhead costs. Consultative councils were not sufficiently alive to the gross waste of money in many directions and did not agitate sufficiently for satisfactory replies to their questions.

Mr. Davies wanted to know:

'Why did the North Western Gas Consultative Council allow itself to be palmed off without receiving actual figures of the cost of the new palatial Blackpool showrooms? Local people put the cost at a figure of £150,000 to £200,000—a ridiculous sum.

'How do members of consultative councils justify their expenses? The sum of £13,000 paid to the North Western Gas Consultative council seems quite fantastic.

'Why do not gas and electricity boards curtail advertising? Utilities are essential services; periodic announcements of new appliances should suffice.

'What useful purpose do cookery demonstrations serve? Those I have attended are no more advanced than housewifery or domestic science at school. And why are two demonstrators required for a class of eight persons?

'Why spend hundreds of pounds on stands at summer shows? Who would think of buying a gas cooker at a horse show?

'Merseyside and North Wales Electricity Board state bad debts have cost £50,000. No wonder! I received the bill on the 12th, a reminder on the 22nd and a final notice on the 30th, several days after it was paid. At 8d. per communication that is expensive administration. No account is taken of the many people paid monthly. A prompt settlement discount would be an economic proposition.'

Meter thief says I'm the gasman

BRADFORD POLICE SEEK SHINY-SHOED MAN

A MAN posing as a gas meter inspector called at 20 houses in Bradford one day last week, emptied the meters, and got away with a haul believed to be in the region of £60. The full extent of the thief's work may not be known, as his talk convinced many housewives, especially as in most cases he gave rebate, which is often the procedure when the official gas meter inspector calls.

The police have a description of the man they want—tall, no hat, dark raincoat, and a pair of brand new very shiny shoes, by which most of the tricked housewives remember him. The man is said to have knocked at the door, opened it, and called out 'Gas man' and the unsuspecting housewife has let him go into the cellar.

Apparently he has some key which opens the coin box, which he empties, and then goes to the living room, where, in many cases, he has handed over a rebate. If asked for the statement which is always left by genuine inspectors he said, 'We have just run out of receipt books. A statement will be forwarded in a day or two.'

The North Eastern Gas Board only became aware of this exploit when housewives rang up and said they were suspicious about the collector who had called. They had just realised that it was a month too soon for the normal collection and that the man was not dressed in proper uniform.

Diary

March 21.—I.G.E., EASTERN SECTION: Boston. 'Lincoln Undertaking 1949/56,' by D. W. Ault.

March 21.—INCORPORATED PLANT ENGINEERS: Royal Society of Arts, John Adam Street, Adelphi, Strand, London, W.C.2. 7 p.m. (Tea 6.30 p.m.). 'Pumping Plant in the Field,' by H. P. S. Paish.

March 22.—JUNIOR INSTITUTION OF ENGINEERS: Pepys House, 14, Rochester Row, Westminster, S.W.1. 7 p.m. Ordinary Meeting. 'Gas Chromatography,' by H. W. D. Hughes.

March 23.—WESTERN JUNIORS (Joint Meeting with WALES AND MONMOUTHSHIRE JUNIORS: Assemble at Stapleton Rood works, Bristol, at 11 a.m. for tour of inspection. Official luncheon at the Grand Hotel, Broad Street, Bristol, 12.30 for 1 p.m. Joint Meeting, Grand Hotel, 2.45 p.m.

March 25.—WEST MIDLANDS G.C.C.: Committee Room, Gas Offices, Council House, Birmingham 3, 2.30 p.m.

March 26.—MIDLAND JUNIORS: Staff Mess Room, West Midlands Gas Board, Council House, Birmingham. 'Recent Developments in Gas for Cremation.'

March 27.—YORKSHIRE JUNIORS: Leeds. 'The Search for Natural Gas,' by I. Gillesby.

March 27.—INSTITUTE OF FUEL: Institution of Civil Engineers, Great George Street, London, S.W.1. Four Papers on Dust Deposition and Atmospheric Pollution, 5.30 p.m.

March 28. — NORTH OF ENGLAND SECTION, I.G.E.: 30, Grainger Street, Newcastle-upon-Tyne. 'Selling a Heat Service,' Alan S. Middleton. 2.30 p.m.

CONTINUED FROM P. 610

Scottish Gas Board Projects Total £1 Mill.

mission in bulk to these five undertakings, with subsequent cessation of production at these places.

For the first stage of the work, a sum of £345,800 has been allocated: Mains, governors, compressor and remote control instruments, £288,700; Nos. 1, 2 and 3 settings of No. 1 retort bench at Dunfermline works to be rebuilt, including ancillary work, £53,600; urgent repairs at Lochgelly works, £3,500.

Other five-figure work to be carried out in the Fife Group includes £10,149 for the construction of 15-in. diameter main from Leven to Buckhaven (this will supply low-pressure gas from Leven to a section of the town at present supplied from a high-pressure main, resulting in a saving in pumping costs); and £10,149 for mains and services for 383 houses in an Aberdour development.

The laying of 8-in. diameter steel main from Arbroath to Carnoustie forms an important link in the grid mains system to be constructed in the county of Angus during the next few years. A sum of £59,000 is allocated for this work. Another Dundee Group item is the resheeting of the outer lift of No. 2 gasholder at Dundee gasworks, for which £14,145 is allocated.

GLASGOW DIVISION

Glasgow Division is also concerned in a grid project. For the laying of 5,000 yards of 18-in. and 3,700 yards of 12-in. diameter spun-iron main from Hollandhurst to Bellshill, a sum of £76,000 is allocated. This main forms part of the system of grid mains to be constructed in the Glasgow and Lanarkshire areas in the future, and is designed to enable substantial quantities of gas to be transmitted into Lanarkshire from Glasgow or, alternatively, from Lanarkshire into Glasgow, depending upon the availability of future supplies of coke oven gas in the area.

A further sum of £78,000 is set aside for the laying of 7,000 yards of 18-in. diameter spun iron main from Clyde Iron Works to Provan gasworks. This main is designed to transmit crude coke oven gas from Colville's coke ovens at Clyde Iron Works to the Provan gasworks, where it will be purified and mixed with the gas produced at Provan before transmission to Glasgow.

Extensive alterations at Provan gasworks, totalling £97,716, are envisaged. The programme includes: Additional expenditure (to enable increased quantities of gas to be dealt with) on the erection of eight new reinforced concrete purifiers, £10,000; repair and renewal of railway siding, £40,000; erection of a new main and secondary electrical sub-station, required for the purpose of supplying the new retort house now under construction, and the new booster house, the construction of which will shortly be commenced, £40,000; installation of belt conveyor weighing machines, £3,216; installation of Connersville meter, £4,500.

EDINBURGH DIVISION

The Edinburgh and South-East Division list includes projected expenditure of £73,370 on the Galashiels grid, eastern section—the laying of 4-in. diameter spun iron main from St. Boswells to Jedburgh and a 6-in. diameter spun iron main from St. Boswells to Kelso. The Galashiels grid, eastern section, is planned for construction during the period 1957-59 and the two grid mains now to be undertaken are extensions to the existing main supplying St. Boswells from Galashiels, thus enabling gas production to cease at Kelso and Jedburgh. To complete the eastern section of the Galashiels grid, it is intended that the mains system shall be further extended to supply the smaller undertakings at Coldstream, Duns, Earlston and Lauder.

Also in project in the Edinburgh and South-East Division is the construction of a part of the East Lothian grid allowing for the Haddington gasworks to supply gas in bulk to East Linton and Aberlady. New stages of the work are: Construction of grid main from Haddington to Aberlady, £20,210; construction of grid main from Haddington to East Linton, £25,860.

A sum of £250,000 has already been authorised for the reconstruction of 'A' and 'B' benches at the Granton gasworks, Edinburgh. Now a further expenditure of £13,500 is called for. The reconstruction of 'A' bench, which is now complete, involved special work, in particular reconstruction of the waste heat flue and extensive chimney repairs which were not originally allowed for. Extensive replacement of retort iron work was also required. The new allocation covers these additions and also allows for similar special work which may be required on 'B' bench.

SOUTH-WESTERN DIVISION

The South-Western Division is having to allocate in the Kilmarnock Group £21,446 of additional expenditure incurred on major projects, owing to increased costs. That includes £4,846 for a new continuous vertical retort bench at Kilmarnock (already authorised £210,000); £12,000 for the grid main from Kilmarnock to Galston, Newmills, and Darvel (already authorised £60,546); and £4,500 for the laying of 14-in. diameter trunk main from Kilmarnock gasworks to Bellfield housing estate (already authorised £10,927).

These projects and figures were revealed at a meeting of the Scottish Gas Consultative Council, held in Edinburgh under the chairmanship of Sir Robert Nimmo on March 13.

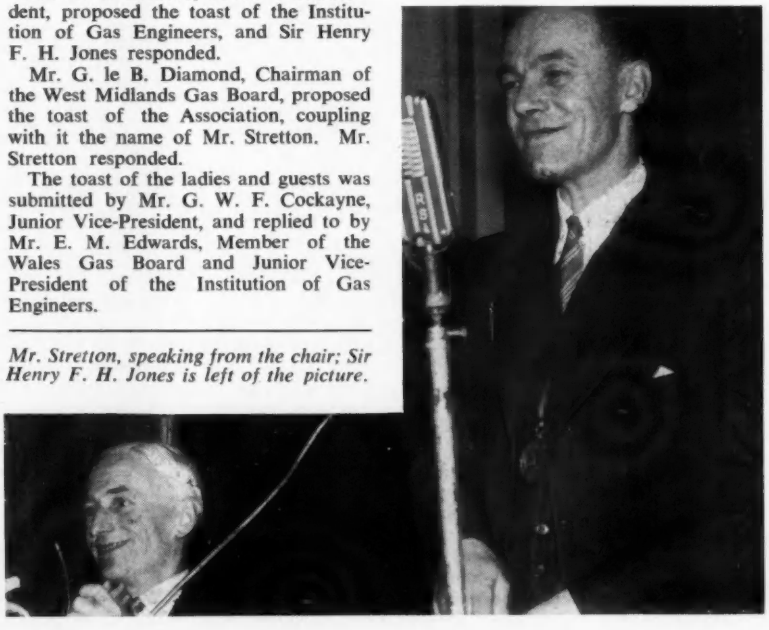
Midland Juniors' Annual Dinner

THE Midland Junior Gas Association held its annual dinner at the Station Hotel, Dudley, on March 9, the President, Mr. J. A. W. Stretton, occupying the chair.

Mr. D. J. O. Bath, Senior Vice-President, proposed the toast of the Institution of Gas Engineers, and Sir Henry F. H. Jones responded.

Mr. G. le B. Diamond, Chairman of the West Midlands Gas Board, proposed the toast of the Association, coupling with it the name of Mr. Stretton. Mr. Stretton responded.

The toast of the ladies and guests was submitted by Mr. G. W. F. Cockayne, Junior Vice-President, and replied to by Mr. E. M. Edwards, Member of the Wales Gas Board and Junior Vice-President of the Institution of Gas Engineers.



Mr. Stretton, speaking from the chair; Sir Henry F. H. Jones is left of the picture.

Gloom Lifts from New Zealand Gas Industry

PRESIDENT GIVES REASSURANCE AT ANNUAL MEETING OF THE GAS INSTITUTE OF N.Z.

AT our last conference there was an atmosphere of gloom, and some doubts were expressed about the number of works that would stay in existence, about the future of the Institute and our own future individually, after the proposed co-ordination, Mr. J. S. Hungerford, President of the Gas Institute of New Zealand (Incorporated) stated in his Presidential address at this year's annual conference.

Since then, however, the future of the industry and of gas staffs has been considerably clarified, he continued. The proposals about gas staff made by the electrical supply authorities in their submissions to the Gas and Electricity Co-ordination Committee were extremely harsh, but in reply to the Institute's protestations the supply authorities' Counsel, Mr. H. L. Boughton, has pointed out that 'It is absurd to suggest that the power supply authorities can carry on the gas industry without the assistance and help of the technical officers in the gas industry. No electrical engineer is going to endeavour to carry on the gas industry without getting all the help he can from those people who have carried on the gas industry, and those people are members of the Gas Institute.'

Fuel supplies throughout the world are barely sufficient to meet ever-increasing demands, and the New Zealand Government has decreed that co-ordination is necessary although national integration in its true sense is not at this stage proposed. It may be, however, that coming shortages of electrical power may make it so. As practical gas technicians we are agreed that integration of all fuel supplies is a good step, but co-ordination on a local basis without national control is not sufficient to ensure the best utilisation of gas, though we will co-operate fully in an endeavour to find a workable solution.

What is desired is an integrated and co-ordinated fuel supply industry controlled by a ministry, corporation or board. This body would then act on the advice of the nation's scientific and technical officers, and in viewing the power requirements of the whole nation invest capital in the right scheme to the national advantage, without bias towards one section or another of the fuel industry.

Competition between the fuel industries is desirable as long as a fair basis is established with regard to price equation. Gas at present is subsidised, and one objection to co-ordination is that electrical prices will rise and electrical consumers will foot the bill for gas. Apart from the fact that gas consumers are also electrical consumers, the true reason is that competition between the industries is not on a fair basis. Electricity is sold to the supply authorities on a five-yearly contract, so that its price to the public can be stabilised. In the gas industry, each increase in coal prices, freight, wages, etc., has to be passed on to the public. Gas companies pay income tax; the supply authorities do not.

Electricity Also Subsidised

Surely it is obvious that the price of electricity is subsidised also.The State Hydro-electric Department is expected to fail to meet its charges by £3 mill. during the final two years of the present contractual period. Since this £3 mill. is not recoverable in the next contract period, it appears that electricity is subsidised. On a proportionate scale, this is very similar to the subsidy paid on gas sales.

Power charges—for both gas and electricity—will rise substantially over the next decade. Expenditure of about £500 mill. is required up to 1957 to enable the electricity supply to lag just behind demand—in other words, an increase in the present capital investment in electricity in this country of approximately 400%. The State Hydro-electric Department estimates that the charges for power will rise 50% in the next few years, but will decrease slightly to a figure around .73 pence per unit at the end of the 18-year period. Gas prices will also rise, because of the upward trend in coal prices and freight rates. But let us hope that integration will follow after co-ordination, and that when gas and power charges are equated the cheapest form of energy in capital costs—gas—will be more fully utilised, to the benefit of the country.

In New Zealand we are embarrassed by shortage of good gas coal, and any move to transfer our demands to the sub-bituminous coals will be greatly welcomed. Due also to labour difficulties the carbonising process is losing ground fast. The nature of the work, necessitating dirty and arduous conditions, means premium payments. Other processes of gasification, mainly cyclic methods, have the superior advantages of lower labour requirements and better working conditions. Now is the time for our industry to plan for the future. Broadly, there are two types of plant we can utilise to produce town gas, other than total dependence on oil as will be the case with the new Hastings plant. These are low-pressure plants of the familiar water-gas type using coal instead of coke, and total gasification plant or the high-pressure 'Lurgi' type plant.

Most Suitable Plant

With later improvements in design and operation of gas turbines, it is probable that a 'Lurgi' plant will be operated in the Waikato, either to produce electricity with surplus gas being bled into a pipeline to Auckland, or vice versa. This would make a very flexible plant, particularly useful for peak-shaving, and most economic in operation. But as our population centres are too scattered for economic use of Lurgi plant generally, the plant most suited to our purpose is carburetted water-gas plant operated on coal or coke, depending on the coke market, or total gasification. It is perhaps significant, too, as pointed out by a number of authors in the 'GAS JOURNAL' during the past twelve months, that next to coke-oven gas and oil gas, the total gasification plants are now making a cheaper gas (on 100% load) than the old conventional plants, in the United Kingdom today.

We have seen the determination of the Government and the stated policy of the State Hydro-electric Department that the gas industry is to be preserved and expanded. Unfortunately, over the period of the war and post-war years our industry has lost ground, due to the lack of a national fuel policy to encourage the best possible use of all available resources. This has resulted in repeated acts of discrimination against gas by both Government departments and electric supply authorities.

Much of the adverse Press publicity can be explained by a lack of appreciation of the essential contribution the gas industry can make to the fuel supplies of the Dominion. It has been the policy of the industry not to indulge in acrimonious discussion in the Press or even to advertise gas, or the viewpoint of the gas industry, in contentious matters printed in the local papers. Whether this was a right or wrong attitude is beside the point; gas and electricity are now to co-ordinate, and I make a sincere plea that the past be forgotten and that there is no antagonism in future on either side—competition, yes; but let us have no bias or contention.

We for our part look forward to regaining the ground lost in the past, and in view of the Government's determination to preserve the industry, we can anticipate that gas will soon recover its rightful place in the fuel supply industry. The great flexibility of gas and its three strong points—low capital cost per unit of power produced; continuity of supply; and ability to store energy to cover peak loads, give a measure of confidence in the ability of the industry to surmount any temporary setbacks.

Although we have been declared essential, let us not assume that we are thereby efficient, but let us strive constantly to improve our efficiency. There is no doubt that the Gas Association's mobile laboratory service has improved our efficiency, but I have the feeling that more can be made of it yet. My final plea, then, is to utilise this service to the full. Essentiality without efficiency is not enough.

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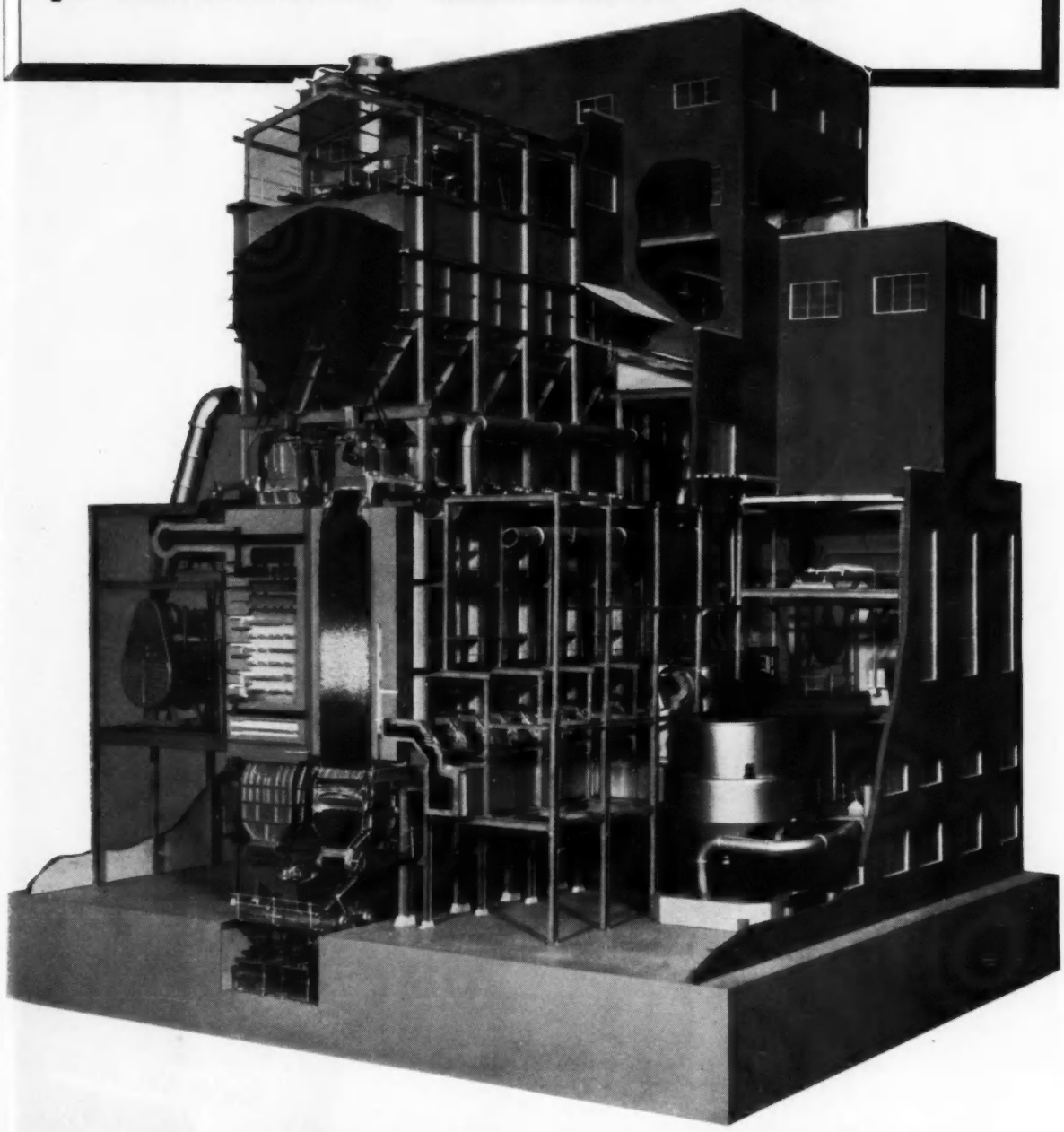

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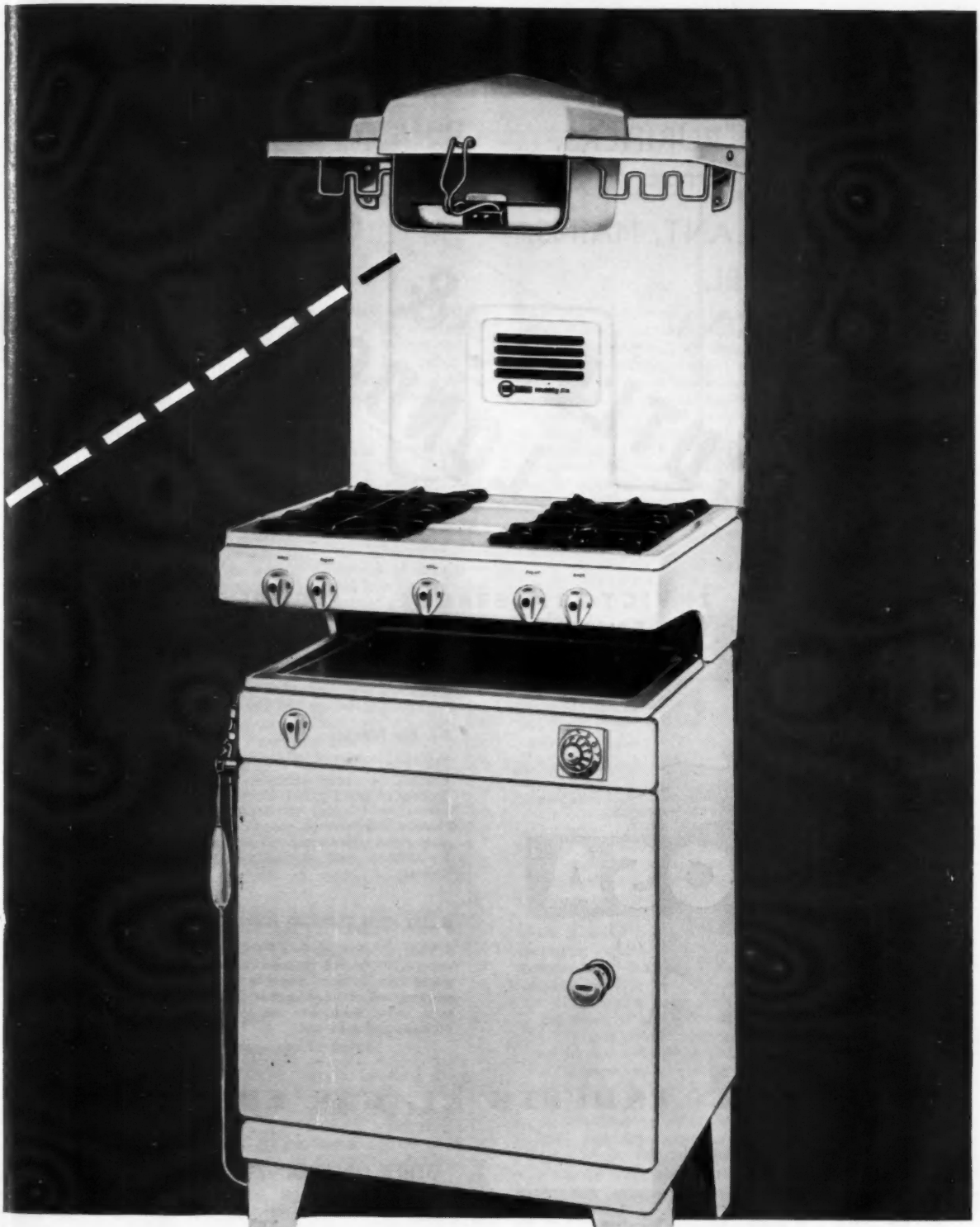

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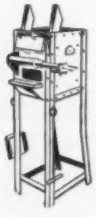

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From a paper to the Wales and Monmouthshire Junior Gas Association on February 14.

The Implementation of a Fuel Policy in Wales

By ALAN YATES, M.Inst.Gas E., A.M.Inst.F.
WALES GAS BOARD.

IN February, 1955, a paper entitled 'Wales Gas Board—Integration of Fuel Supplies' was presented to the Institute of Fuel jointly by Messrs. E. M. Edwards, S. L. Wright, W. T. Hird, and T. S. Ricketts. Based upon the fact 'that the national interest demands that the best possible use shall be made of our national fuel resources,' the paper describes in detail the metamorphosis which has taken place in the gas industry in Wales, since 1946.

The demands made by the country during the war years, together with a protracted period of shortage both of labour and of materials for maintenance, left the gas industry, after hostilities had ended, fighting hard to uphold a tradition of service to the community with plant which was badly in need of extension, overhaul, or replacement. In 1946, working parties were set up, at the instigation of the Ministry of Fuel and Power, to investigate the greater utilisation of coke oven gas in South Wales and Monmouthshire and it is largely upon the reports of those working parties, submitted in 1948, that the South Wales gas grid has been developed.

The pattern of the now well known South Wales gas grid shows a gas distributing network which serves to integrate gas supplies to individual gas undertakings into two sections which at the present time are entirely separate. The Eastern section covers an area of approximately 580 sq. miles roughly in the shape of a square with Abergavenny, Chepstow, Aberdare and Barry at the corners. The Western section extends approximately parallel with the coast from Bridgend to Milford Haven, although the operation of the section from Llanelly to Milford Haven and Pembroke has been delayed because of the current restrictions in the supply of imported fuel. The North Wales Gas Grid, in its present form, may be considered as a single main following a line from Llangollen to Connah's Quay and along the North Wales Coast through Bangor into Anglesey with branches to serve individual gas undertakings which lie to either side of this route.

These gas grids are supplied with gas, purchased from external sources, together with coal gas manufactured in the Board's own plants at Pontypool and Maelor (Wrexham) and with peak load water gas. The gas purchased is made up principally of coke oven gas, both purified and unpurified, with a relatively small quantity of methane from one individual colliery in North Wales.

Hydrogen Sulphide Removal

The unpurified gas which forms 74% of the total gas purchased by Wales Gas Board is conveyed to suitably located stations for removal of hydrogen sulphide. One example of this is that of Aberavon Works, at Port Talbot, which is situated close to the coke ovens owned by the Steel Company of Wales and receives, purifies, and transmits approximately 20 mill. cu.ft. per day of coke oven gas.

In the Eastern section of the South Wales Gas Grid and in the North Wales Gas Grid, in addition to the supplies of gas purchased externally, there are supplies of base load coal gas manufactured in vertical retort installations of modern design. Each base load coal gas plant is situated strategically close to a coalfield. Base load operation, in efficiently run carbonising plants of economic size, using coal from sources 'on the doorstep,' is an essential feature of the economy of the integrated gas supply system as described.

Variations in day to day requirements for gas are met, as far as possible, by variation in the quantities of gas purchased from external sources within the terms of the agreement by which the gas is made available. Variations in demand do occur, however, which are outside the agreed limits of volumes of gas to be supplied, and it is intended that this paper shall serve as a means of discussing some of the methods planned and adopted for meeting these variations in demand for town gas while, at the same time, making the most economic use of native and imported fuel supplies.

Connected to each of the gas grids in the Wales Gas Board are carburetted water gas plants which are maintained in a state of mechanical readiness to meet peak load or emergency demands. The proportions of peak load plant capacity, expressed as a percentage of maximum availability of purchased coke oven gas, are given, for each gas grid, in Table 1.

TABLE 1

	Percentage Availability of Gas		
	Maximum availability of all base load gas	Maximum coke oven gas availability	Maximum peak load plant availability
	(*a*) %	(*b*) %	(*c*) %
South Wales Gas Grid:			
(*a*) Eastern Section	125	100	46.5
(*b*) Western Section	100*	100	68.5
North Wales Gas Grid.. ..	190*	100	67.5

* These figures apply at the present time but see later remarks regarding onset of methane supplies from coal mines during 1957.

Operation of water gas plants in South Wales on low volatile coals is practised, particularly on hand-clinkered sets. The coals used have a proximate analysis of the order: Volatile matter 10%-12%, ash 3%-5%, moisture 1%-3%, swelling No. 1-2 (just agglomerating).

The coal is generally received as cobbles, 2 in. to 4 in., which is found to be quite satisfactory for handling and plant operation, where it is found that the main advantages, compared to the use of local cokes with low ash-fusion temperatures are:

(1) Reduced solid fuel consumption per 1,000 cu.ft. of gas made, of the order of 20%;

(2) reduced oil consumption per 1,000 cu.ft. of gas made, of the order of 15% to 20%;

(3) improved clinkering operation. This is of particular importance in hand-clinkered sets where it has been found that the operating time between clinkering periods can be extended by 50% or even doubled where previously coke with high ash content from South Wales coals had been in use. Further, the actual clinker formation is small since the main bulk of material removed is in the form of fine ash;

(4) One result of the latter is in extended gasmaking hours between renewal of generator refractory linings.

Disadvantages, however, are found in:

(1) Release from the stack of a puff of smoke at the beginning of the blow period, the intensity of which can be minimised by increase in the frequency of charging;

(2) Increased production of 'fliers';

(3) Increased wear on the grates of self-clinkering generators, caused by the increased generator base tem-

peratures, which can, however, be controlled by the reduction of blow period, and increased upward steaming;

(4) Reduced make of gas per cycle of up to 5%. On hand-clinkering sets, however, this factor is more than offset by reduction in unproductive time which gives an increase in gas output per day;

(5) Increased loss of fuel by breakages. This is particularly applicable to installations in which the fuel is subject to mechanical handling after storage.

The publication by the North Western Gas Board of methods adopted and results achieved in the carrier gas process for accelerated carbonisation gave rise to a series of field experiments under differing conditions in the Wales Gas Board.

It was soon appreciated from these experiments that this process offered attractions when used for peak load purposes, and so retorts at two stations have been equipped with the necessary carrier gas connections and interlocking gear. At each of these the arrangement has been designed on simple lines with the minimum of equipment compatible with safety in operation. The larger of the two installations, which supplies base load coal gas to the Eastern section of the South Wales Grid, is provided with a mixture of washed producer gas and unpurified coal gas as the carrier gas admitted at the base of the retorts, while the other installation, at an undertaking which is not yet included within the area of grid gas supplies, uses only unpurified coal gas as a carrier gas. The equipment for accelerated carbonisation in the latter installation is only intended for use in meeting peak demands of relatively short duration, for example, in filling the gap between the onset of demand and full operation of additional retorts.

Electrically Operated Valve

The coal gas is returned from the inlet of the purifiers to the retort house through an electrically operated valve, a Holmes B.M. meter, a constant pressure governor, and a non-return valve. The electrically operated valve, which is controlled through a solenoid, serves as a means of cutting off the flow of carrier gas if the coal gas exhausters should fail to prevent both a flare of gas at the retort bottom mouthpieces and an unnecessary loss of gas. In the retort house the carrier gas main divides into individual supplies to the retorts, and passing through a rotameter inferential flowmeter the gas enters the coke chambers at the level of the extractors. Purge steam connections into the coke chambers are provided above the discharge doors and into the gas supply pipes immediately downstream of the operating valves. The operating gear to each retort consists quite simply of a sliding bar set between the quick-acting gas and steam valves and connected to them so that as the bar is moved one valve is closed and the other opened. An extension of the bar prevents any movement of the discharge door wheel when the gas valve is open but permits movement of the wheel when the steam valve is open. The timing of the steam purge is left in the hands of the operators.

During trials on this plant, in which Forest of Dean coals were being carbonised, it was found that the gas make could be increased by at least 30% and coke for sale per ton of coal carbonised increased by 17%, with an increased coal throughput of 50%. The increase in gas make became apparent one hour after increasing the coke extraction rate and settled down at the higher level 40 minutes later. Deposition of spongy carbon on the retort face, caused by the degradation of the hydrocarbons present in the carrier gas, was noticeable after five or six days' operation at the increased coal throughput, and its presence first became apparent by irregular coal travel which in turn makes retort operation difficult.

The coke discharged was noticeably larger in size than that from normal carbonisation, and a volatile content in the coke of 2.6% (dry basis) was recorded.

The cost into holder of the gas made during the period of accelerated carbonisation was found to be slightly lower than that of gas made under conditions of normal coal throughput, so that it was considered on this particular plant that the process had proved its value in being able to give a substantially increased rate of gas make for short periods.

The capital cost of all equipment used in connection with accelerated carbonisation was £420 per retort at the small works and £350 per retort at the larger base load station where a producer gas/coal gas mixture of low C.V. is used as the carrier.

The passing of the Clean Air Act emphasises the importance of making available to the public a form of smokeless solid fuel which is readily ignitable and which will continue to burn without recourse to appliances designed specifically for use with low volatile fuels.

Other area boards have demonstrated that smokeless fuel can be successfully made by the carbonisation in continuous vertical retorts of low-rank coals with weakly-caking, low-swelling properties and a volatile content of about 30%-35%. Operation of the retorts may be with an increased throughput of coal at a normal carbonising temperature or with normal throughput at a reduced temperature. The range of throughput and temperature variation may be increased by the use of the carrier gas process. The end product from the low-rank coals with a volatile content of 2%-5%, after screening, is normally sufficiently reactive to give satisfactory results on a stool-bottom grate.

South Wales, which has for so many years been noted for its 'smokeless' steam coals, is notably short of low-rank coals which are suitable for processing in this way, so that it is likely that advantage will be taken of the 700 rank Forest of Dean coal, which is at present being used under normal carbonising conditions at Monmouth Undertaking. Experimental work is expected to begin shortly to determine the extent to which the throughput of coal can be increased and to examine generally, with and without the carrier gas process, the possibilities of developing the production of smokeless solid fuel from this coal.

The summer-time reduction in gas demand creates problems which are equally important, but precisely opposite, to those of meeting cold weather peak demand, but the contracts for purchase of gas by the Wales Gas Board from external sources stimulate minimum daily or weekly quantities which must be accepted by the Board in order to avoid financial penalties.

Much good work is being done and has already been done by those directly concerned with selling gas in promoting summertime sales in both the domestic and industrial fields. Wherever possible, such action is the most satisfactory way of meeting contract obligations and enables the Board's coal gas plants to be operated at a high load factor with a consequent increase in revenue. The problem, however, is likely to remain, at least to some extent, for some time to come and efforts are being made to provide a solution by substitution of town gas for alternative fuels used by the Board, such as the use of gas in dual fuel engines driving compressors which saves large quantities of diesel oil and its use for the heating of retort settings with an increase in coke available for sale.

Engine Requirements

In the first example, the supply of fuel oil to the engines is restricted to ignition requirements only, while town gas provides the balance of total fuel requirements. Under these circumstances it is found that the gas consumed in the engines amounts to about 2% of the volume of gas compressed at medium pressures of 30 to 40 lb. per sq. in. gauge.

In the second example, gas is thermally reformed in the producer fuel bed to give a mixture of principally carbon monoxide and hydrogen which improves the quality of the producer gas.

Although experiments at Pontypool in the summer of 1956 demonstrated the operational suitability of this process, work is not yet sufficiently far advanced to give a detailed statement of technical and financial considerations, but indications, which must still be proved by a systematic reproduction of results, show that gas can readily replace about 25% of the thermal input to producers, which is normally provided by coke, and that the process could be economic if a ready market can be found for the coke so replaced. It is likely that this latter proviso will eventually determine whether or not the process is sound policy.

Liquefied petroleum-gas, particularly butane, has been used at various times and at various works in the Wales Gas Board, and in most cases it is used for augmenting the thermal output for relatively short periods. To meet peak demands at isolated undertakings, for assisting outputs from small works during retort resetting and, occasionally, to make good the deficiencies in calorific value of coke oven gas, are typical instances of its use, but the LP-gas therm is not a cheap one, and during

the present shortage of petroleum products it is inconveniently expensive, when net fuel cost alone is considered. Taking the broader view, however, its use can be an economic proposition in such cases as those stations, attached to one or other of the gas grids, where purchased gas is purified and where a measure of peak-load and standby plant has to be provided. If a diluent, such as producer gas or blast furnace gas, is available, the ability to store therms in a form by which they can be added to gas entering the town gasholders, within a fraction of the time normally taken with peak-load gasmaking plant, is attractive. Added to this is the comparatively low capital cost of installation which is of the utmost importance where it is known that the plant will have only intermittent use, but one of the main advantages of this form of gas supply and possibly the most important, is in avoiding the economic burden imposed by maintaining water gas plant under fire at low load factor.

With this in mind an order has been placed for the installation at the Grangetown gasworks, Cardiff, of storage containers, and vaporising and mixing equipment, to hold a maximum of 100 tons of LP-gas, equivalent (excluding diluent) to approximately 10 mill. cu.ft. of gas at 475 B.Th.U. per cu.ft.

Although butane will be the material stored, the plant will be capable of storing propane, too, so that any variations in availability of material from the refinery may be met.

The plant will consist, principally, of three horizontal cylindrical storage vessels connected to duplicate steam-heated vaporisers which will deliver LP-gas vapour into the inlet main to the gasholders through pressure regulators, a meter and a volume regulator. Each storage vessel will be suitable for storing butane, propane or mixtures of the two. The vessels will therefore have a design working pressure of 210 lb. per sq. in. and be tested to a pressure of 420 lb. per sq. in. The vaporisers will have a design working pressure of 250 lb. per sq. in. and be tested to 500 lb. per sq. in. with pressure relief valves set to start to discharge at 200 lb. per sq. in. In addition to these pressure relief valves, each storage vessel will be equipped with a vapour pressure gauge, a liquid contents thermometer, a magnetic type liquid contents indicator and a fixed tube liquid level gauge (ullage gauge). Liquid and vapour connections to each storage vessel and vaporiser will be fitted with excess flow valves to provide protection against failure of or damage to interconnecting pipework. The valves will be arranged to close as soon as maximum design flow limits of liquid or vapour are exceeded.

The vapour leaving the pressure regulators will be controlled at three lb. per sq. in. gauge or lower and will be measured by a ring balance flowmeter with orifice fitting. Flow control of the vapour will be effected by means of a calorific value controller operating on a sample of the final mixed gases entering the holders, taken downstream of the mixing point. The diluent used will pass the vapour delivery point mixed with coke oven gas and water gas.

Progress Report

Although not strictly within the terms of reference of this paper, it may be of interest to give a progress report upon the 'Whitland Experiment.' The Whitland undertaking, in Carmarthenshire, has been supplied with a butane:air mixture since January, 1952 and at the time there were full descriptions of the butane:air plants installed there, the arrangements for the transport and handling of butane from the Llandarcy refinery to the gasworks and the conversion of appliances on the district. It is not intended, therefore, to repeat in detail what has already been said, but rather to summarise the experience gained at Whitland over the past five years.

Two plants were installed, each capable of delivering to the gasholders a mixture of butane:air at a calorific value of 730 B.Th.U. per cu.ft. at a specific gravity of 1.22.

In the 'Mallet' plant, installed by W. C. Holmes & Co., Ltd., the butane vapour used is obtained either directly from the vapour space in the storage containers or from liquid butane by heat exchange with warm water circulated through a coil in the vaporiser. The butane vapour passes through benzole in a bubbling hood washer and is delivered by a positive blower to a mixing chamber. Here it is mixed with air which has passed through gas oil in a bubbling hood washer followed by a ring-packed scrubber and is delivered by a similar positive blower.

Both blowers are driven by a single motor with a common V-belt and the relative volumes of vapour and air are determined by adjustment of the air blower pulley. The fine control of the butane:air ratio is obtained by adjustment of a by-pass valve on the air blower, and the butane:air mixture is delivered from the mixing chamber direct to the gasholders.

In the 'Gasair' plant, supplied by the Draketown International Corporation, New York, butane is vaporised by a direct fired vaporiser and maintained at constant pressure. Vapour is delivered to the fixed nozzle of a venturi inspirator where air is drawn in, in direct proportion to the vapour, to mix with the latter in the venturi tube. The butane:air mixture then passes direct to the gasholders.

Both plants operate with a minimum of maintenance although it must be said that the supervision they receive is good and minor adjustments are carried out as they become necessary.

Butane is transported by road from Llandarcy Refinery in cylindrical containers, each of which holds 1¼ tons of liquid.

The condition of appliances in the district, which have been in operation continuously during the past five years, is remarkably good. The butane:air mixture contains less than 0.5 grains of sulphur per 100 cu.ft. and so the corrosion of appliances is negligible and as might be expected this applies particularly to water heaters.

Butane Supply

The results obtained at Whitland have made available a good deal of information about the supply of butane:air through a mains' distribution system. The most important points are:—

The oxygen content of the butane:air mixture, at approximately 16% by volume, indicates the necessity of maintaining distributed gas of low dew point. It is found in practice that the theoretical dewpoint of a 23%/77% butane:air mixture of about 40°F. is achieved, depending upon the relative humidity of the air at the time the mixture is made. Oil filming of the holders is practised and test pieces suspended in the holders and mains have shown that rusting need not be any cause for anxiety.

The cost of gas made available for sale is extremely sensitive to variations in the cost of raw material. Increased cost of purchased raw material cannot be offset at all by a proportionate increase in revenue from the disposal of by-products, so that the gas made available has to bear the whole of any such increase.

Labour, process and maintenance costs can be kept at a comparatively low figure.

The cost into holder of the butane:air mixture compares reasonably with the cost of conventional town gas manufactured in units of a size of equivalent thermal output.

The availability of gas expressed as a proportion of LP-Gas purchased is very high. At Whitland, 97%-98% of the butane purchased appears as gas for sale in the gasholders.

Careful attention must be paid to the 'unaccounted-for gas' figure. This was first noticed at Whitland and was the direct result of the re-laying of the sewerage system in the village which caused disturbance to the adjacent gas mains. Theoretically, the increase in calorific value of the butane:air mixture over that of conventional town gas is offset by an increase in specific gravity so that the thermal loss through a given orifice, for example from a leaking joint, would be much the same whether coal gas or butane:air was passing. In practice, however, there are added difficulties to be met with in tracing small leakages of butane:air as compared to coal gas, which demand extra care to maintain the 'unaccounted-for gas' figure within reasonable limits. Leakage of butane:air at Whitland is traced with the aid of the 'Poole explosimeter.' This instrument operates on the principle of obtaining an 'out of balance' reading on an electrical bridge caused by differing thermal conductivities of gases which give different electrical resistances in two arms of the bridge. The 'out of balance' condition of the bridge is indicated on a milliammeter, calibrated 0-100, which is the maximum figure and slightly lower than the lower explosive limit of the butane:air mixture. To operate the instrument which is very sensitive, a sample of aspirated air is provided, but great care has to be taken when it is used over bar holes compared to the Short diffusion gauge with conventional gas, partly because sampling is being affected from what is virtually a 'point' source.

Supplies of refinery gas are purchased from the Llandarcy

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refinery and transmitted direct to a chemical manufacturer in Swansea. The gas is conveyed through 2¼ miles of 8 in. flanged and butt welded steel main from the refinery boundary. The system has been in operation since October, 1956, and the main is designed to permit a possible future extension to Aberavon works for processing to supplement other gases in use, or planned for use, at this station. Much valuable experience is being gained, meanwhile, in handling refinery gas with a calorific value of the order of 1,800-2,500 B.Th.U. per cu.ft., and a specific gravity of the order of 1.1-1.7 (air = 1.0) which contains hydrogen sulphide to the extent of 2,000 grains per 100 cu.ft., or the equivalent of approximately 3% by volume.

Since April, 1956, supplies of methane have been purchased from the National Coal Board's Point of Ayr Colliery in North Wales. The methane is treated at the Point of Ayr Methane Station which has been erected, by the Wales Gas Board, on a site adjacent to the colliery, and is designed specifically for the purpose of reforming the methane and delivering the resultant gas into the North Wales gas grid with the maximum of flexibility to suit gas demands. A description of the station was published in the Technical Press last year.

Methane from the Point of Ayr Colliery is discharged from bore holes and delivered to the surface under natural pressure with a purity of gas delivered of 97%-98%, which makes it comparable to a natural gas supply.

Arrangements have been made with the National Coal Board for supplies of mine gas from other collieries in North and South Wales which will be purchased by the Wales Gas Board and transmitted to manufacturing stations for processing, but the mine gas supplies from these other collieries will be extracted from bore holes under negative pressure, so that it is likely that a quantity of air will be drawn in with the methane which will lower the purity of the gas to a methane content of between 55%-80% by volume.

Work is now in progress on the laying of pipelines to form the Afon Valley methane grid, in South Wales, which is designed to convey mine gas from the National Coal Board's Avon, Duffryn Rhondda and Glyncorrwg Collieries to Aberavon Works. This is expected to be in operation before the end of the present year and provision has been made by laying pipes of adequate size, for additional supplies of mine gas to be handled from other collieries at later stages of development.

The mine gas, received at Aberavon Works, will initially be made available for town gas supplies, and will be mixed with coke oven gas, or used for the cold enrichment of blast furnace gas or blue water gas at the inlet of the oxide purifiers. The oxygen content of the mine gas will be used to take the place, wholly or in part, of air normally admitted for the revivification of the oxide in situ.

Investigations are in hand, or will shortly begin, on several new projects connected with the possible production, in the broad sense, of town gas, and although it is still too early to give details such projects being considered are:

(I) The large scale production of gas from oil and oil products. A preliminary study, lasting several months, has already been made in which particular attention has been given to a combination of the Texaco process of partial oxidation of feedstock for hydrogen production and the hydrogenation process to give town gas at an available pressure of the order of 300 lb. per sq. in.

(II) the use of slagging producers for the gasification of low grade fuels. This work is connected with the possible release of additional quantities of coke oven gas for peak load purposes.

(III) The bulk use of the liquid hydrocarbons, butane, propane, and methane for use in gas production.

DISCUSSION

Mr. S. L. Wright, Wales Gas Board, said that in planning gas supplies in South Wales, with its availability of coke oven gas, the way was clearly to put that gas to use. In doing so, contracts had to be entered into with guarantees that definite quantities of gas would be taken all the year round in order to secure a price acceptable to both parties concerned. This lead to the problems associated with surplus gas in summer-time and insufficient gas in winter-time, and much work has been and is being done on their solution.

It would be interesting to hear the views of salesmen upon two questions. First, which should come first, the production of gas or the demand for gas, and secondly, what could be done to level out seasonal variations in demand to reduce the need for peak load plant?

Referring more closely to the substance of the paper, he asked, what were the opinions on the future for accelerated carbonisation and, leading to the work that was being done at Partington, what did the future hold for our development as a two fuel industry?

He thought that the author could, with advantage, amplify his references to the 100 ton LP-Gas storage installation planned for Grangetown so that an idea might be formed of its equivalent volume availability per day expressed as town gas and the rate at which the LP-Gas diluent mixture could be released onto the district without affecting combustion characteristics of the mixed gas.

The reference to the use of the Gilbert and Prigg diagram for predicting the use of methane was interesting but the use of G_4 gas as a basis for defining the limiting lines was questionable. Would not a greater margin of flexibility be given by showing boundary lines for the gas mixture that was normally distributed with its appliances adjusted to suit that gas?

Mr. L. Gray, Pontypridd, said that he was, like others, sorry to see works closing down on receipt of a bulk supply, but this sacrifice had to be made in the interests of progress.

In connection with the accelerated carbonisation experiments, he asked, what was the effect upon the gas off-takes? Did the ash content affect the process in any way and were there any variations, and was it necessary to make any changes in combustion chamber temperatures?

Mr. Whitney, Newport: 'In Newport, up to 40% of carburetted water gas is used at peak load periods, but finding the labour necessary to operate peak load plant is the chief source of worry on account of the comparatively short period of operation. The men have to be absorbed in other work during off-peak periods and it is difficult to keep trained plant operators readily available, especially in smaller undertakings.

'The use of LP-Gas storage plant may well assist materially in solving this problem in the future.'

Mr. W. H. Tarn, Wales Gas Board, said that it was pleasing to note that the demand for gas had forced these production problems upon us. Similar problems had been met and overcome in the United States where a greater interchangeable pattern in industry was present. For instance, a manufacturer might change from oil to gas and possibly back again all in the course of twelve months by virtue of small changes in price.

Summer-time loads were essential to a well-planned grid supply system and more of these demands would be forthcoming in South Wales in the near future. Because of the high degree of integration of gas supplies the price of gas was quite low, and with the present sales prospects and as domestic space heating develops, the peak load situation would become worse. The Northern Gas Board had employed differential rates (summer and winter) to try and alleviate this position.

Electricity would become increasingly competitive in the future, and to combat this, production costs of gas would have to be kept as low as possible.

Mr. C. G. Reave, Wales Gas Board, referred to the use of coal in water gas plant and thought the figure of 20% saving in the generator rather high. Somewhere in the region of 14% would be more realistic, and similarly, the oil consumption would probably be reduced by 12%-15% instead of 15%-20%. Smokeless solid fuel had been found unsuitable for use in producers and one Board had had to import coke for this purpose.

'Since the change over in Whitland to butane/air, the gas service has developed by virtue of a good product, showing that this type of plant can be used for other purposes than peak load equipment,' he added.

Mr. V. Sutherland, Wales Gas Board, said that many gas production methods had been discussed but an exception had been made of underground gasification. As storage was a major problem on grid supplies, comments on the use of underground storage would be useful.

In reply to Mr. Wright, **Mr. Yates** stated that the future of accelerated carbonisation appeared to be bright particularly for the production of reactive smokeless solid fuel. He expressed it as his opinion that the time would eventually arrive when the gas industry would become principally concerned with the production of one fuel only. In the domestic field, where stool bottom grates still commanded a great although diminishing propor-

tion of the space heating load, the production of reactive smokeless solid fuel underlined the importance of catering for two fuels.

He went on: 'Although all prospects of future low priced gas appear to lie in the direction of the total gasification of fuel, the possibility of obtaining low costs coupled with flexibility did not appear to be very great at present. The principle of sacrificing production of gas for the sake of production of smokeless solid fuel (which can be stored in summer-time) is attractive.

'The LP-Gas storage plant at Grangetown is designed to enable propane and/or butane to be mixed with producer gas, to give up to 4 mill. cu.ft. per day of gas at 475 B.Th.U. per cu.ft. for mixing with normal supplies of coke oven gas and water gas. It has been found that up to 20 to 25% of butane/diluent can be mixed with normal town gas without sign of lifting at the flame port of aerated burners.'

The limiting lines on the Gilbert and Prigg diagram given were constructed around a G_4 gas for the sake of convenience. In this particular case the effect of constructing the limiting lines around the normal gas distributed upon the limits imposed by lifting of the flame would be negligible.

Referring to experiments on accelerated carbonisation, individual trial periods were not sufficiently extended to give appreciable difficulty with build-up of deposits at the gas off-takes. There was no evidence of any effect from the ash content of the coal used. During periods of increased coal throughput the combustion chamber temperatures were maintained at the level of 1,310 to 1,330°C. as maintained in normal operation. It was noted, however, that the surface temperature of the retort monolith was reduced.

He agreed with Mr. Whitney upon the problem of maintaining availability of peak load plant operators. The labour requirements of LP-Gas storage plant was commendably low but the use of the latter, combined with a diluent, such as producer gas or blast furnace gas, for peak load purposes, was limited to approximately half of the quantity of carburetted water gas which could be accepted without unduly affecting combustion characteristics of town gas.

The author thanked Mr. Reeve for his assessment of the savings which might be expected by the use of coal in water gas plant and stated that the figures quoted in the paper were test results which were obtained under good working conditions.

Concerning the use of butane/air at Whitland, although a decrease in sales was experienced at the beginning of the 'Whitland experiment,' sales for the past three years increased by 10% each year.

In reply to Mr. Sutherland, he understood that an impetus had been given by National Coal Board to work on underground gasification in Britain, but that he had no knowledge of new information connected with the subject. Underground storage was not at present contemplated in Wales Gas Board although experiments were being carried out by the Northern Gas Board. So far no positive results were available.

From an address to the Scottish Western and Eastern Junior Association on March 2.

The Changing Scene

By E. M. EDWARDS,

MEMBER, WALES GAS BOARD

In recent years we have seen a great change in the structure of the gas industry and considerable development has taken place. These changes have been accompanied by advances in the technique of gas production and transmission; greater use is being made of gas from coke ovens and oil refineries and the concentration of production at larger works has been accelerated. All these necessary measures have led to the cessation of production at some 370 works since 1948, and it is apparent that, where it is economically sound, events will continue to follow this pattern, leading to the transmission of gas over greater distances than formerly.

The Gas Act, 1948, requires area boards 'to develop and maintain an efficient, co-ordinated and economical system of gas supply and to satisfy, as far as it is economical to do so, all reasonable demands for gas in the area.' The methods of achieving these objectives will vary with the circumstances as they exist and are likely to arise, in the different parts of the country. There are, however, certain fundamentals that are common to many problems.

Consideration of major schemes of development, particularly those involving integration of supplies, demand close consideration of many factors before decisions are made.

The assessment of future demands for gas is of vital importance. An over-assessment may lead to excessive capital expenditure with a harmful effect upon gas prices, while an underestimation may lead to a higher final total capital expenditure upon plant and mains with higher operating costs, which is also detrimental to the business. Schemes should be designed with flexibility to cater economically for normal development of demand, and to meet changed circumstances which later may develop. Reasoned judgment must be applied to information available from all sources, and thought given to changes in the social and domestic habits of the people, to variations in industrial emphasis, and to the anticipated future competitive position and availability of alternative fuels.

Not only must costs be considered as they stand today, but also the declining value of money, in an endeavour to assess future cost levels as far as one is able to do so. Advances in costs of labour and materials bear more heavily upon the smaller plants and, in general, it will be found that the economic gas transmission distance is continually increasing.

The long-term availability and probable prices of raw materials for processing, and the probable net return from the products made must, of course, be studied closely for each type of gas production process considered.

Depreciation of physical assets should be upon a realistic basis since if the period is too long the assets may be worn out and have to be replaced before all of the capital has been repaid or, conversely, with too short a period, the capital charges will be cleared long before the end of the useful life of the asset, so that the present consumers will be paying unduly high prices for gas. A fair balance should be struck, bearing in mind that it is wiser to underestimate the life rather than to over estimate it. Depreciation periods for all the most important items of plant and equipment have been agreed to by the Gas Council.

With the steadily increasing costs of materials and labour, future maintenance costs should be reduced as far as possible by making use of high, but not necessarily expensive, standards of design, and in adopting suitable protective measures. Here attention should be paid to the effective life of the asset as a whole, for it is important to remember that when the day arrives for the asset to be renewed, the replacement cost is likely to be far greater than the original cost; and so the maximum economic and efficient life should be the aim for all plant.

The investment and annual allowances approved by the Inland Revenue Authorities should also be taken into account when considering the effect of new projects upon income tax charges, and when plant becomes obsolescent because of new

projects, the outstanding capital of this plant installed after vesting date must be written off in the year during which the obsolescence occurs.

As soon as it has been decided to proceed with a project it should become revenue earning as quickly as possible, since this will avoid idle capital, and ensure the earliest possible attainment of the benefits which the scheme was designed to achieve. Thorough planning, therefore, before the job starts, and good job organisation while it is going on are essential. Mechanical equipment can often help to speed up the job and effect economies, but all machines must be kept employed, since idle machines are expensive.

Adverse weather conditions can seriously increase the costs of some projects so, wherever practicable, work should be programmed so that it will be carried out during the periods of the year when weather conditions are most likely to be suitable. Major grid construction work, for instance, is usually carried out at considerably lower cost during the spring, summer and early autumn than during late autumn and winter.

Planning the Grid

The routing of grid mains should be planned with great care, since it is of first importance to determine, not only the pattern of demand, but also the future available sources of gas supply throughout the working life of the system. Thought has to be given to the probable lines of development of new gas making processes, and the extent to which gas is likely to become available from other industries must be assessed, especially from existing and future coke oven plants and oil refineries.

The type and nature of the land will have their effects on the route to be decided upon and highways and districts subject to subsidence from mining or other causes should be avoided.

With a high load factor transmission costs per therm are lowest, and since capital charges upon mains and compressor stations are a constant, and represent a substantial part of the total costs, it is of vital importance to increase the annual gas sales and to level out the annual load curve.

The diverse demand characteristics of the undertakings connected to a grid help to improve the daily and seasonal load curves for the grid as a whole.

In Wales a total gasholder storage of 45% at periods of maximum demand at present is regarded as adequate, though later 40% will probably be acceptable. Gasholder stations suitably located enable the grid to operate at a steady pumping rate throughout the day and the manipulation of holder stocks and the flexibility of limited production plant take care of daily requirements within a week.

As well as the seasonal load variations, it is important to make a special study of the annual load curves under normal, and exceptional, weather conditions, so that while circumstances will not be the same in various parts of the country, the curves will generally show that considerably greater quantities of gas produced at low cost could be sold during the summer months if the business could be found. The cost of meeting winter peak load demands for short periods of extreme severity is very high, so among other solutions to these problems we have adopted the following:

(i) The developing of summer-time contracts for the sale of large quantities of gas to industrial users at special tariffs. Tests are now being carried out on the first installation of specially designed burners that can use gas, oil or a combination of both.

(ii) The installation at Cardiff and Port Talbot of 100-ton L.P. gas storage and vaporising plants that can be brought into commission almost instantaneously to meet sudden short period peak demands.

Since it is not always economic to instal peak load plants at the heart of the grid, it is sometimes worth considering installing new plants as they become necessary to meet increasing requirements, along the line of the grid towards its extremities. If such plants are only required to operate for limited periods under conditions of unusually heavy demands, this could result in lower capital compressing costs and pumping pressures, and could give added flexibility as demands upon a grid system grow substantially.

Although adequate gasholder storage is essential to the economic and reliable operation of a gas grid, the capital and maintenance costs of gasholders are very high and if the total holder storage of a large group of individual undertakings each manufacturing its own gas is considered, it will often be found to be about 75% of the combined maximum daily demand. Since a grid system, however, can normally be operated satisfactorily with only a 45% total storage, a large increase in gas sales can usually be faced without increases in gasholder capacity, except where this may be necessary for exceptional reasons; but many factors have to be taken into account when assessing gasholder requirements. These are the variations in undertakings' hourly demands, variations in daily consumption during the week of maximum demand, the effect of the five-day week upon week-end industrial loads, and gasholder repairs.

The capital cost per 10,000 cu.ft. capacity of a two mill. cu.ft. holder is about 40% that of a 50,000 cu.ft. holder, and maintenance costs per unit volume will also be lower, so that the development of an integrated system will generally lead to the construction of larger-sized holders when additional capacity becomes necessary rather than a large number of small gasholders, except where these are essential for security reasons.

The economics of gasholder storage must be taken into account when considering the design and financial effect of grid schemes because the economies to be derived can be very considerable *with an expanding market* and it cannot be too strongly emphasised that the development of gas sales is vital to the full attainment of the economic success of engineering and technical developments.

Unaccounted-for gas must be allowed for when considering the financial effect of grid schemes. A figure of 2% is reasonable, but it should not be overlooked that, depending upon the operating pressure, about 1.3% is due to condensation and, unless the gas is later resaturated before it is supplied to the consumers, there may be a loss of revenue to the Board unless allowance is made for the dew-point correction in official testings for calorific value. Experience shows that with the grid systems in Wales a large and increasing proportion of the gas supplied to consumers is dry. Direct supplies from the grid, which sometimes reinforce low-pressure systems, arrangements for the automatic control of holder stations, and the rather surprising fact that gas does not always become fully saturated in gasholders, contribute to this, and since there are many advantages to be gained from the distribution of dry gas it has now been decided, as soon as the oil situation permits, to adopt the general policy of supplying dry gas to all consumers served by the North and South Wales gas grids; oil filming of gasholders and other necessary measures will be taken as quickly as possible.

Well-known Principles

The methods of assessing the economic combination of diameters of mains and pumping pressures are well known and the principles enunciated in Lacey's paper, 'The economic aspects of high-pressure distribution,' presented to the Institution of Gas Engineers in 1928, remain fundamentally sound. The use of the Lacey, the Panhandle Eastern and the Weymouth formulæ give substantially the same results. It is our practice to use the Lacey modified Unwin 'B' formula for gas flows, and the actual flows are reasonably close to those calculated. Pipeline design is a very important subject in itself, but brief reference only can be made to the many factors demanding consideration, including steel specification, pipe wall thickness, maximum operating pressure, maximum testing pressure, maximum gas velocities, and terminal pressures. The welding specification, testing specification, properties of gas to be transmitted, nature of ground, and methods of internal and external protection are also of great importance and the use of properly designed and maintained cathodic protection systems must also be included.

The economics of alternative types of compressors and of prime movers have to be weighed for each scheme and it is important to foresee the probable variations that in later years may take place in the costs of alternative forms of energy, bearing in mind that the total power requirements will normally increase materially with time as the loads grow and pumping pressures are increased. Decisions should not be made solely upon the costs of energy at the time the scheme is being considered, but when practicable, it is wise to design the station to use alternative forms of energy, so that reasonable care may be taken to allow for possible future substantial changes in the relative prices of fuels.

An example of this is one of our recent new compressor stations at present designed to deliver 24 mill. cu.ft. per day at 30 lb. per sq. in. The total capacity installed is 28 mill.

cu.ft. per day, with the following forms of power:—

No.	Compressor capacity. Cu.ft. per hour.	Cu.ft. per day.	Type of drive.
2	218,000	5.2 mill.	Dual fuel engines (gas and oil).
1	218,000	5.2 mill.	Steam engine with exhaust steam for process work.
1	370,000	8.9 mill.	Constant speed electric.
1	370,000	8.9 mill.	Variable speed electric.

When the capital and operating costs of major schemes are being considered, attention should be paid to the probable increase in costs that will occur between the date of the preparation of the scheme and its completion.

Increasing labour costs should lead to an extension of automatic control of compressor and gasholder stations, but it is not worth while to instal automatic equipment if labour not fully employed is retained, unless there are other operating advantages, although the case for the more extended application of the remote control of valves and apparatus at holder stations from central control rooms is becoming increasingly strong. Preliminary experience of variable remote control by telephone lines has been reasonably satisfactory but we are now closely examining the application of V.H.F. and micro-wave radio for control purposes.

To provide economical gas supplies at small undertakings remote from large stations presents difficult problems, but in Wales we have found that often the best answer is to provide these small undertakings with bulk gas supplies through small diameter mains designed to operate at pressures up to 170 lb. per sq. in. and fed by automatic recompression sets taking their supplies from the principal grid mains. The economics of each case have to be evaluated separately and such factors taken into account as the replacement and operating costs of existing small plants, the certainty that future rising costs will affect small production units more seriously than large units, and the fact that in many cases the incidence of bulk supplies to a limited number of small undertakings will not in practice affect the timing of extensions at large works, where the production units are of large capacity. Further, the provision of a limited number of bulk supplies to small undertakings will have no practical bearing upon the designed capacity of the principal grid mains up to the points of the installation of the small recompression stations. From actual experience of the result of providing bulk supplies of gas of consistent quality to small undertakings the gas sales of such undertakings increase rapidly as soon as the bulk supplies become available. This is very important when assessing the economics of potential schemes since with drive and energy gas sales can reasonably be expected to increase by 30% to 50% within a very few years.

DISCUSSION

Mr. J. M. Brown, Vice-President of the East of Scotland Junior Gas Association, opening the discussion, said that Mr. Edwards had indicated a number of fundamental processes which must be considered in the development of major schemes. It was obvious that these fundamentals had been followed right through, very successfully, in the projects carried out by the Wales Gas Board. The summertime contracts to promote the sale of gas that had been mentioned by Mr. Edwards constituted one of the main themes in American gas supply, but there emphasis was being placed on the domestic consumer, who was being persuaded to use gas in the air-conditioning of his home. Mr. Brown commented that he would be glad to see similar success attending efforts here, though it would probably not be in that particular field of gas consumption. They would probably be quite happy if they could persuade the domestic consumer to go wholeheartedly in for gas to heat his home.

Replying, **Mr. Edwards** said that they attached very great importance to the development of the domestic heating load, of which they were conscious that they were not getting as much as they should. Special tariffs had been introduced, and they were pressing very hard in this matter for they were satisfied that it was quite economic for a house to be heated by gas. Domestic gas sales were not going up as rapidly as they would like, but they were increasing very slightly year by year. Replying to a question by Mr. Brown on the use of spun iron for mains in South Wales, **Mr. Edwards** said that there was not much purpose in installing steel mains if the maximum pumping pressure was not likely to be above 30 lb. per sq. in. On a further point he commented: 'In the mining areas it is standard practice, even though the miners have free coal, for gas cookers to be installed. The miners' wives demand it.'

Mr. T. S. Ricketts, Chief Engineer, Scottish Gas Board, who was associated with many of the Wales Gas Board schemes that had been described by Mr. Edwards, paid tribute to the energy and ability of Mr. Edwards in the carrying out of these projects. Continuing, he said that the whole essence of the paper, dealing with the availability of fuels, was one that must be of great interest to all associated with the Scottish Gas Board. In Scotland they were now thinking along similar lines and in terms of coke oven gas from steelworks and N.C.B. ovens, methane, and even natural gas, and they were considering integration from the point of view of available fuel resources. In Scotland the total availability of coke oven gas and methane did not reach the same proportions as in Wales. Therefore they must make sure that their carbonisation plants were of the very highest order. Mr. Edwards had emphasised the importance of planning for future demand. That was something that was very important indeed. It was also something where the engineers were to an extent dependent upon the salesmen. If they did not get the sales, the engineers' plans could go astray.

Commenting that Mr. Edwards was to be congratulated on the speed of his mainlaying, **Mr. J. T. Pay** asked if direct labour was used, and what happened to the men in the wintertime.

Mr. Edwards replied that they used both direct and contracting labour. When using direct labour on a major scheme they augmented the nucleus of their squads with local labour recruited when they were on the scheme. Also they mechanised the job as far as it was economically possible. On smaller schemes they did not mechanise to the same extent, but enough to keep the numbers employed to the minimum. They were able to find economic work for the nucleus of the squads in the wintertime.

Questioned by **Mr. J. Ferguson,** Glasgow, Mr. Edwards said that he was a strong advocate of putting plant out of doors where it was reasonable to do so. For one thing, it was safer if there was any leakage. It was, however, impossible to generalise. In Wales their problem was easier because they had decided to distribute only dry gas. From an operating standpoint and from a cost standpoint, his preference was for outdoor plant if it was possible. On a further point raised by Mr. Ferguson regarding the crossing of rivers, he said that provided the cost of an overhead crossing was within reasonable reach of a river-bed crossing, he would strongly urge the overhead crossing. Mr. Ferguson had also asked: 'What is the maximum distance you would like to pump crude gas from the coke ovens to a station?' Mr. Edwards replied that their main lines were pumping crude gas about two miles. The maximum distance they had had experience of was about seven miles.

Mr. R. O. Emony, referring to Mr. Edwards' remarks on the use of V.H.F. and micro-wave radio for control purposes, asked if there were not some difficulties in the way of using this. **Mr. Edwards** replied: 'I do not think we can permit ourselves as an industry to be denied the opportunity of using something which might be of real utility to our industry. The matter is under consideration now. If the G.P.O. were resistant, we would have to take the strongest possible action that we could take, right up to Gas Council level. It is very important.'

Mr. Deans commented that the combination burner that could use gas, oil, or a combination of both, should be used with some discretion. It might turn out to be rather a double-edged sword, particularly in those industrial processes where fineness of temperature control was very important.

Mr. Edwards agreed that discretion should be the watchword. In reply to another point by Mr. Deans about the summertime terms, he said: 'For certain classes of business, where we can only get the business at a cut price in the summer time, and we could not get it at all under other contracts, it is better for us to get that business at a special reduced price than not to get the business at all.'

Mr. J. D. Campbell, Montrose, President of the East of Scotland Junior Gas Association, proposed a vote of thanks.

Trade News Supplement

- **Drip-proof motors**
- **Anti-freezing equipment**
- **New protective paints**
- **Publications recently received**

One of the new drip-proof electric motors by Newman Industries, Ltd.

NEW RANGE OF DRIP-PROOF MOTORS IS INTRODUCED

AN entirely new range of drip-proof motors in the smaller horsepower group, from ½ to 50 h.p., such as that illustrated, has been introduced by Newman Industries, Ltd.

With the addition of this new, lower horsepower range the company now manufacture a complete range of drip-proof motors from ½ h.p. to 600 h.p. Although the provision of such a wide range is significant in itself, for Newman Industries Ltd. it also signifies a new manufacturing policy.

The main claims for the new motor are: Compactness, efficiency, reliability, and really low cost. Chief features are: 1, built to draft British Standard specification CW(ELE)6246 (dimensions) and BS.2613 (electrically) amended to include Class 'E' insulation; 2, improved ventilation; 3, more complete protection; 4, excellent electrical performance; 5, new insulation technique gives improved performance all round; 6, new terminal box design—speeds up wiring and installation; 7, die cast rotor dynamically balanced—vibration free running; 8, versatility of mounting and application.

It offers substantial economy in initial cost for the majority of applications such as, pumps, fans, compressors, conveyors, agricultural equipment, woodworking machinery and machine tools, in fact whenever the protection afforded by drip-proof enclosure is considered adequate.

Basically the new motor is a normal squirrel-cage induction motor of the simplest form of construction and for this reason it is impossible to pin-point any one design feature as unique or revolutionary. It is the combined effect of the finer points of design, after many minor mechanical and electrical adjustments made in the light of critical tests given to every aspect of the motor during its development, which contribute most to the achievement of the original aim.

Factors such as lamination design, frame contour, fan efficiency and air flow vent shapes and positions, bearing type and size, winding technique, slot insulation, lubrication and others were all carefully considered in relation to the production plan.

Of these factors the most important is the ventilation system. It is such that the maximum ventilation efficiency of an 'open' type motor has been retained but with a degree of protection very much greater than is usual with this kind of motor. This is achieved by fitting pressed 'air deflectors' over the end windings.

Designed primarily to give more correct and efficient air flow over the bearings and within the motor, for cooling purposes, these deflectors also give complete protection to the windings. —*Newman Industries Limited, Yate, Bristol.*

Anti-freezing Equipment

ORDERS have been received by Thos. Dryden & Sons, Ltd., of Preston, for fitting 40 gasholders with Crowther-Dryden automatic electrical anti-freezing equipment.

This method of heating for gasholders was designed in 1946, in collaboration with Mr. E. Crowther, C.B.E., then General Manager and Chief Engineer of the Newcastle-upon-Tyne & Gateshead Gas Company, on the basis of his original investigations and experimental data.

The first gasholders to be equipped was a 3 mill. cu.ft. holder (Oxley all-welded design) built for the Newcastle Company in that year, and the system continues to work entirely satisfactorily.—*Thomas Dryden & Sons, Ltd., Grimshaw Street Foundry, Preston.*

Neoprene-based Protective Paints Attack 'Impossible' Corrosion Jobs

E. AND F. RICHARDSON LTD., an old established company, still described as makers of fine varnish and enamels, have, since the war, concentrated their efforts on providing paint for previously impossible corrosion problems in heavy industry. They are now adding to their Adcora range Semprene-Adcora, a neoprene-based range of protective coatings.

This range of coatings is based on neoprene and Hypalon rubber. Neoprene is a synthetic rubber, which was introduced to American industry in 1931. It is the product of Du Pont research, its starting point, acetylene.

The coatings are neoprene-based for two main reasons which are inter-related: It is generally considered that coatings with a final film thickness of under 5 mils. fail due to inadequate coverage on hard to coat areas. Single coat film builds of over 10 mils. are easily obtained with Semprene-Adcora P.6, claim the makers. Above 5 mils. coating performance can be controlled. Thereafter it depends upon the specific resistance of the coating itself. Semprene-Adcora has specific resistance to a wider range of chemicals than any other commercially available coating, it is claimed. Also it has outstanding ability to combat severe abrasion and high temperatures.

The type of coatings available at present include: (a) P.4. A one-pot maintenance coating in black for brush or spray application.

(b) P.6. A two-part high solids coating for more severe conditions, also in black but capable of giving a film build of up to 20 thou. in one coat, the average being in the order of 10 thou.

(c) P.7. A primer for use with P.6 and P.8 over concrete, wood and steel.

(d) P.8. A reinforced grade of P.6, the abrasion resistance and build of which is even greater.

By the middle of the year it is hoped that P.4 will be available in red and grey and in addition a Hypalon top coating in aluminium will emerge, followed shortly after by Hypalon finishes in six other colours.—*E. & F. Richardson, Ltd., Castle Mills, Buckingham.*

PUBLICATIONS RECEIVED

THE MANUFACTURE AND USE OF REFRACTORIES

A WELL illustrated descriptive catalogue of the comprehensive range of high-grade refractories manufactured in their Jarrow-on-Tyne and Consett brick-making plants has been published by the Consett Iron Co. Ltd. It gives details of refractories from their manufacture to their application in industry.

The refractories section of the Consett Iron Co. Ltd. has played a large part in the development of improved refractories, and has had the advantage that, as part of a great steel and iron producing concern, its experiments have always been conducted with a clearly defined, practical end in view. Further, every forward step has been subject to extensive tests under actual steelwork conditions.

In consequence, Consett refractories offer the refractory user very definite advantages. They are of proved efficiency, having undergone thorough tests in use in the Company's own steel furnaces, while their composition, to the Company's own formulas, ensures great durability and a reduced necessity for repairs and replacements, with consequent economy for the user.

The Consett range includes all types of basic refractories—magnesite, magnesite-chrome, chrome-magnesite and chrome—for the steel, copper and other non-ferrous industries and the cement industries, as well as high-alumina and a full range of silica refractories for the steel, carbonising, and gas industries.—*Consett Iron Co. Ltd., Consett, Co. Durham.*

'WIDEST RANGE OF ELECTRONIC EQUIPMENT FOR INDUSTRY'

'INDUSTRIAL ELECTRONIC EQUIPMENT,' is the title of a new fully illustrated publication released by Lancashire Dynamo Electronic Products, Ltd. During the past ten years this company have been in the forefront of the drive to supply industry with its need for electronic control equipment, and the wide range of products available from this specialist organisation depicted in the publication now being released, covers almost every facet of industrial electronic control. The range of equipment is claimed to be the widest so far offered to industry.

In ten years, more than 2,000 different types of equipment have been designed and produced and some 500 types are currently available to industry. Over the same period, more than 15,000 enquiries from industry have been dealt with and over 1,000 types of equipment specially designed to customers' requirements have been developed and produced.

Progress continues and a new phase of expansion involving a 12,000 sq. ft. extension to the present production space has been started in the past few weeks, less than two years after a new 25,000 sq. ft. production unit was opened in 1955.

The rate of progress is such that production has more than doubled every two years and there is every indication that this rate of expansion will be maintained. Lancashire Dynamo Electronic Products, Ltd., will continue to offer an unequalled range of products for application throughout industry and this range will be steadily widened as current development projects come to fruition.—*Lancashire Dynamo Holdings, Ltd., St. Stephen's House, Victoria Embankment, London, S.W.1.*

Arc Welding

A new technical circular (T.C. 107) issued by Quasi-Arc, Ltd., describes the Fusarc/CO_2 automatic arc welding process which the firm has recently introduced. The process has major applications in the shipbuilding and automobile industries.

The electrode consists of the Fusarc patented type of continuous covered electrode with a newly developed type of covering used in conjunction with a carbon dioxide gas shield. This combination of flux and gas shielding allows considerably higher welding speeds than can be achieved with flux alone, and the deposited weld metal is of a high metallurgical standard.

Fusarc/CO_2 No. 1 electrode is the first electrode specially developed for use with a CO_2 gas shield. It is approved both by Lloyd's Register of Shipping and the Ministry of Transport.—*Quasi-Arc, Ltd., Bilston, Staffs.*

Rigid P.V.C. Tube to British Standards

THE latest technical bulletin, *Oxythene*, of Horwitch Smith & Co. Ltd., gives details of Oxythene 'V' grade rigid P.V.C. tube which is now being produced to British Standard pipe sizes in standard and extra heavy grades for use with injection moulded rigid P.V.C. tube fittings.

The introduction of rigid P.V.C. tube fittings for use with pipe to British Standards greatly extends the use to which this piping can be put, since it brings the fabrication of P.V.C. pipe lines within the scope of any skilled pipe fitter or plumber.

Methods used for screwing standard rigid P.V.C. tube are the same as for ordinary steel tube, and methods of sealing and fitting are, in most respects, equal to ordinary pipe fittings practice.

Oxythene 'V' grade rigid tube to British Standards can be used for cold water or agricultural application, for all types of chemical work, for the food industry, for handling food acids, where it is essential that no contamination is present and for all fluid handling, where temperatures do not exceed 60°C.—*Horwitch Smith & Co., Ltd., Pensnett, Staffordshire, England.*

Mechanical Handling

Elevators and skip hoists of the Marco Conveyor & Engineering Co., Ltd., are described in an illustrated brochure recently published by this Company which points out that efficiency of manufacture and reduction of production costs depend largely on the effective use of mechanical handling plant.

The Company have installed plants serving the coal, coke, gas, chemical and foundry industries, to all of which this brochure will be of considerable interest.—*Marco Conveyor & Engineering Co., Ltd., Rowin Works, Leytonstone, London, E.11.*

KU FLOW RECORDER AND INTEGRATOR

A new brochure illustrating the *KU* flow instrument (recorder and integrator) has been produced by George Kent, Ltd.

This instrument provides permutations of recording, integrating, crescent-scale indicating, and automatic-control functions; six maximum-flow differential pressures of 25 in., 50 in., 100 in., 200 in., 400 in. and 600 in. W.G. on an air-on-mercury basis; choice of chart-rotation speed, chart units, chart drive; alternatives of automatic-control functions and desired-value-index (pen or pointer) setting; and mounting for wall, panel or post.

Features incorporated in *Commander* instruments include pen-lifting and pointer-clearing mechanisms which can operate automatically on opening the door and simplify chart changing; removable and self-locating pen arm of special design which gives great rigidity and accurately control the pen-to-paper spring pressure; inseparable pen and pen arm which make for a much cleaner job when filling the pen—the arm is also designed so as not to be subject to torsion from pen friction; and an expanding chart hub which locates or releases the chart as a result of a push or pull motion on the chart knob.

The *KU* flow instrument is one of eight basic models in the group.—*George Kent, Ltd., Luton, Beds.*

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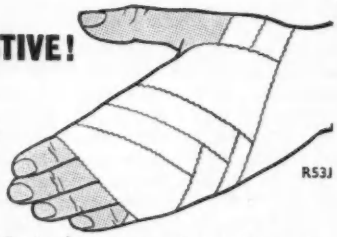

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Classified Advertisements: All small classified advertisements are charged at 2/6 per line (approx. 7 words)—minimum charge 10/-. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

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NORTHERN MANAGER: Philip W. B. King, Flat 1, 7 Langcliffe Avenue, Harrogate. *Telephone:* Harrogate 67625.

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PLANT FOR SALE

SPECIAL OFFER: Large quantity of new cast iron fullway valves, all iron parts, 8 in., 10 in., 12 in. and 14 in. for sale. The Midland Iron & Hardware Co. (Cradley Heath) Ltd., Cradley Heath, Staffs. Tel.: Cradley Heath 6264 and 5.

FOR SALE.—New Oil Pumps—all iron fitted. Evans Duplex. D. A. 8 in. steam 6½ in. pumps. 6 in. stroke, 40 tons per hour. Weir Vertical 8 in. by 9 in. by 18 in. 60 tons p.h. Weir Vertical 4½ in. by 5 in. by 12 in. 2,350 g.p.h. Cleckheaton Engineering Co. Ltd., Cleckheaton, Yorks. Phone 397.

APPOINTMENTS VACANT

INDUSTRIAL GAS ENGINEER. Woodall-Duckham (AUSTRALASIA) PTY., LTD., MELBOURNE, have vacancy for well qualified Industrial Gas Engineer with knowledge and experience in Design, Construction and Operation of Industrial Furnaces. Position is a permanent one with opportunity of developing Furnace Department. Age 27 to 35. Salary £A1,250 to £A1,750 according to experience and ability. FREE FIRST-CLASS PASSAGE TO AUSTRALIA. Write, Personnel Officer, Woodall-Duckham House, 71, Brompton Road, London, S.W.3.

FITTER wanted for maintenance work on Gas Producing Plant and ancillary equipment. Previous experience desirable but not essential. Good rate of pay and permanency for suitable applicant. Possibility of housing accommodation in near future. Apply in writing to The Hepworth Iron Co., Ltd. (Clayworks), Hazlehead, nr. Sheffield.

WEST MIDLANDS GAS BOARD
BIRMINGHAM & DISTRICT DIVISION
VACANCY FOR ASSISTANT CHEMIST

THE position is on the staff of the DIVISIONAL CHIEF CHEMIST, initially for duty at the Saltley Works.

Candidates should possess the Ordinary National Certificate in Chemistry, or equivalent, and some experience of routine testing and control of water softening and benzole plants, etc., would be an advantage.

The salary will be within A.P.T. Grade 6 (£610-£690 p.a.) of the National Salary Scales.

The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications stating age, experience and present position, should be addressed to Mr. J. E. Wakeford, Divisional General Manager, West Midlands Gas Board, Gas Offices, Edmund Street, Birmingham, 3, to reach him not later than April 1, 1957.

J. C. INGRAM,
Secretary to the Board.

WEST MIDLANDS GAS BOARD
CHIEF ENGINEER'S DEPARTMENT
ASSISTANT ENGINEER

THE duties will include work on technical projects and the organisation and running of the Board's Central Control Room.

Candidates should have had extensive experience in the operation of up-to-date gasworks plant. Corporate membership of the Institution of Gas Engineers is an essential qualification.

The salary will be within Group B of the Senior Officers Salary Scales (£1,105 × £40—£1,265 per annum).

The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications, stating age, qualifications and experience, together with names of two referees, should be addressed to the Industrial Relations Officer, West Midlands Gas Board, 6, Augustus Road, Edgbaston, Birmingham, 15, to reach him not later than April 1, 1957.

J. C. INGRAM,
Secretary to the Board.

(*Classified advertisements continued on page* 632

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GASHOLDER INSPECTION. An ASSISTANT ENGINEER required for the Gasholder Dept. at the Company's Head Office in Manchester. Permanent position; progressive salary with non-contributory pension. Candidates must have had a good general education and have served an apprenticeship with a reputable firm of Gasholder Manufacturers, and have had site erection and drawing office experience. Applicants should state age and give full particulars of training and experience.

TECHNICAL ASSISTANT

(aged 25-30)

required for

CANADIAN CONTROLLED GAS COMPANY in RIO DE JANEIRO, BRAZIL

THE Company, which has a total installed capacity of 35 mill. cu.ft. per day, invites applications from suitably qualified men for a post of Technical Assistant in their Gas Works.

Candidates should be experienced in gas manufacture and works maintenance with continuous and intermittent retorts, C.W.G. and ancillary plant, or, alternatively, experienced in the design of gas manufacturing equipment and the lay-out of works' plant. They should hold the Higher Grade Certificate in Gas Engineering (Manufacture) of the Institute of Gas Engineers.

Good salary; three years' agreement subject to renewal, with first-class passage both ways, four months' paid leave after three years' service; superannuation scheme.

Interested candidates should write, in the first instance, giving brief details of qualifications, education, training, and experience to Mr. W. P. Kellett, Joint Manager, Canadian-Brazilian Services, Ltd., 148, Leadenhall Street, London, E.C.3. Applicants whose qualifications are considered suitable will then be asked to complete an official form of application.

SOUTHERN GAS BOARD

DISTRICT DISTRIBUTION ENGINEER

APPLICATIONS are invited from suitably qualified persons for the new post of DISTRICT DISTRIBUTION ENGINEER in the Southern Gas Board, initially to be stationed at East Bournemouth.

Applicants should preferably hold the Higher Grade Certificate in Gas Supply or equivalent qualification and must have had sound experience of high and low pressure distribution with control of district personnel.

The appointment will be made within Grade A.P.T. 10-12 (£820-£1,025) of the National Salary Scales for Gas Staffs, and the starting salary will be dependent upon the qualifications and experience of the successful applicant.

The successful candidate may be required to pass a medical examination and, unless already subject to a Pension Scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required to join the Board's Staff Pension Scheme.

Applications to be made on special forms to be obtained from the Personnel Manager, Southern Gas Board, 164, Above Bar, Southampton, and returned after completion by April 10, 1957.

SOUTHERN GAS BOARD

ASSISTANT DISTRICT DISTRIBUTION ENGINEERS

APPLICATIONS are invited from suitably qualified persons for the posts of ASSISTANT DISTRICT DISTRIBUTION ENGINEERS in the Southern Gas Board; initially the work would be stationed at Bournemouth, Southampton, Portsmouth, and Reading.

Applicants should preferably hold Higher Certificate in Gas Supply or Higher National Certificate in Mechanical Engineering. Previous experience in high and low pressure gas distribution would be an advantage although not essential. Applicants from outside the Industry should have Engineering qualifications and Drawing Office experience.

The appointments will be within Grade A.P.T. 6-8 (£610-£790) of the National Salary Scales for Gas Staffs, and the starting salary will be dependent upon the qualifications and experience of the successful applicants.

The successful candidates may be required to pass a medical examination and, unless already subject to a Pension Scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required to join the Board's Staff Pension Scheme.

Application to be made on special forms to be obtained from the Personnel Manager, Southern Gas Board, 164, Above Bar, Southampton, and returned after completion by April 10, 1957.

NORTH WESTERN GAS BOARD

SOUTH LANCASHIRE GROUP
CHIEF CHEMIST—ST. HELENS WORKS

APPLICATIONS are invited for the above pensionable appointment at a salary within Grade A.P.T. 11 (£850/975 p.a.).

Applicants must possess suitable technical qualifications and have had sound experience and training in the chemical control of a large gasworks.

Detailed applications, giving the names of two referees, should reach the General Manager, South Lancashire Group, N.W.G.B., Radiant House, Cotham Street, St. Helens, within 14 days.

NORTH WESTERN GAS BOARD

LIVERPOOL GROUP
ASSISTANT ENGINEERS (PRODUCTION)

APPLICATIONS are invited for the above pensionable appointments at salaries within Grade A.P.T. 8/12 (£710-£1,025 p.a.) according to qualifications and experience.

The successful applicants will be attached to various sections within the Group and will be employed essentially in the production of gas and other products. Applicants should be members of the Institution of Gas Engineers or be otherwise suitably qualified. A degree in engineering would be an additional advantage.

Applications should be made on the official form obtainable by writing to the Chief Personnel Officer, Liverpool Group, N.W.G.B., Radiant House, Bold Street, Liverpool, and should be returned to him within 14 days.

SCOTTISH GAS BOARD

NORTHERN DIVISION
INVERBERVIE DISTRICT

APPLICATIONS are invited from suitably experienced and qualified persons for the position of DISTRICT MANAGER at Inverbervie.

The salary applicable to the post is in accordance with the Board's scale of salaries A.P.T. 6 Provincial 'B' (£595-£675 per annum) with house to rent.

The position is pensionable and the successful applicant will be required to pass a medical examination.

Applications stating age, and giving particulars of education, training, experience and qualifications should be addressed to the undersigned to arrive not later than Monday, April 8, 1957.

H. S. MILNE,
Divisional Controller.

50, Cotton Street,
Aberdeen.
March 16, 1957.

WALES GAS BOARD

WREXHAM UNDERTAKING
APPOINTMENT OF SENIOR TECHNICAL ASSISTANT—DISTRIBUTION

APPLICATIONS are invited from suitably qualified persons for the above appointment for which the salary will be within the range of A.P.T. 7/8 'A' (£670/£790 per annum) commencing at a figure commensurate with qualifications and experience.

Applicants should be experienced in the High/Low Pressure Gas Distribution Practice, including main-laying and planning, also in controlling labour and the supervision of work being carried out by Contractors.

The position is pensionable. The successful applicant may be required to pass a medical examination.

Applications stating age, experience, qualifications and particulars of training, together with the names of two referees, should be received by the undersigned not later than April 6, 1957.

J. F. LLOYD,
Engineer and Manager.

Gas Offices,
23, Salop Road,
Wrexham.

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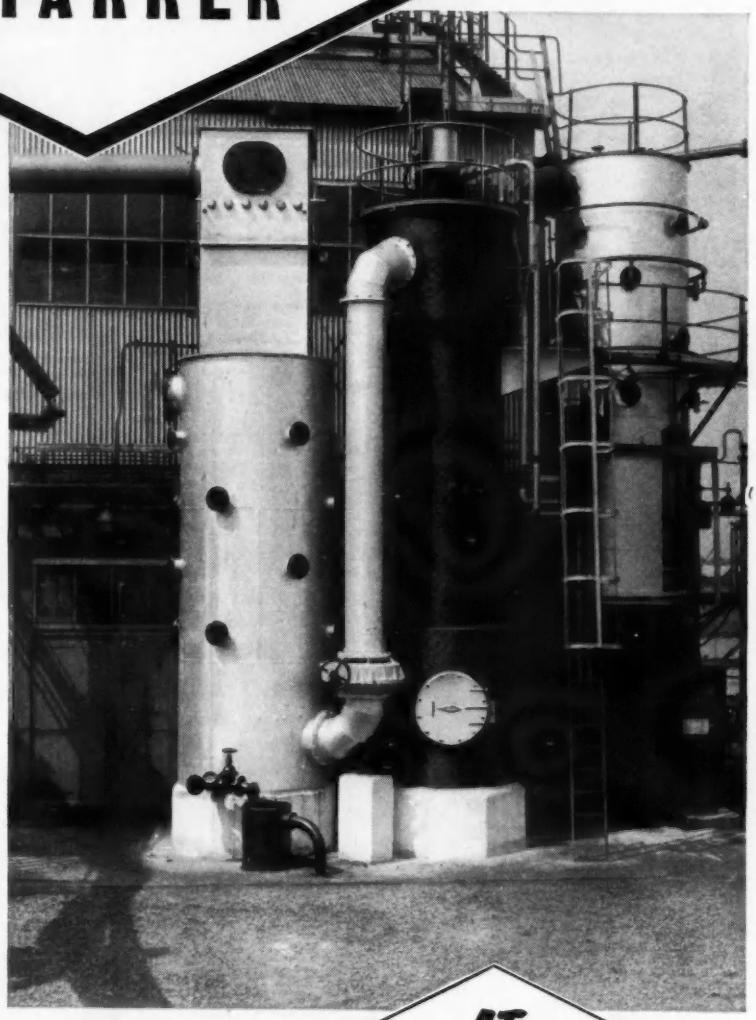

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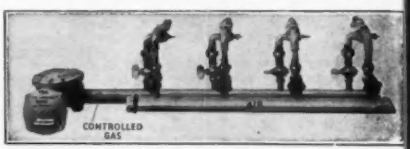

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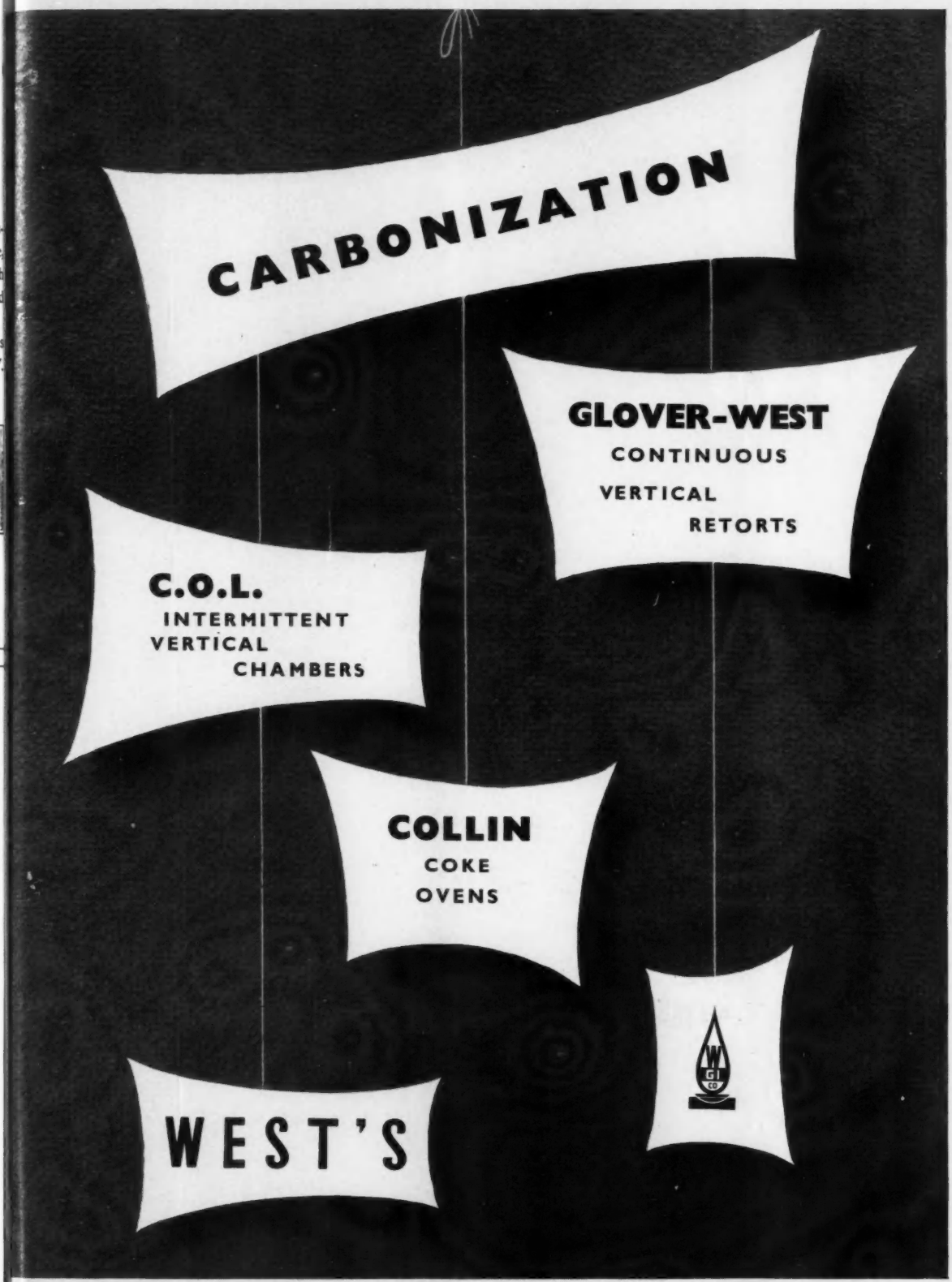

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Wonders of the World

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